Original Research Article

A Cross-Sectional Survey to Assess the Risk Factors of Cardio Vascular Disease among College Students

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Abstract

Introduction: Cardiovascular diseases (CVDs) are the number one cause of deaths globally which claim an estimated 17.9 million lives each year. It is a major cause of disability and premature death throughout the world and contributes substantially to the escalating costs of health care. Modification of risk factors has been shown to reduce mortality and morbidity in people with diagnosed or undiagnosed cardiovascular diseases. Prior assessment is found to be helpful in predictions of absolute cardiovascular risks among young adults.

Objectives: To assess the risk factors of cardio vascular diseases among college students.

Methods: Descriptive survey was conducted among 207 college students at Najath College of Science and Technology, Karuvarakundu, Kerala from 10/10/2019 to 18/10/2019.Convenient sampling method was used to select the samples. Structured risk factor assessment Performa and Biophysical measurements were used as tool.

Result: The study identified 40.57% students as in moderate risk and 5.31% were in high risk for developing cardio vascular diseases. The study reported that 6.2% of students were overweight whereas 45% had elevated blood pressure. It was found that 64.25%of the students had family history of chronic illnesses like diabetes, hypertension, stroke, and obesity. The 8.21% students were smokers out of these, 17.39% were using smokeless tobacco whereas 31.88% were exposed to passive smoking and 12.56% students were drinkers. In terms of physical activity, 62.31% of the students were sedentary. The food habits of 98.56% students were non -vegetarian and 46.85% of them were consuming red meat.

Conclusion: Periodic assessment and comprehensive health awareness would be helpful to modify unhealthy habits and minimize the risk of cardiovascular problems among the college students.

Key words: Risk factors, Cardio vascular diseases, College students.

Introduction

Cardiovascular diseases (CVDs) are the number one cause of death globally, taking an estimated 17.9 million lives each year. More than 75% of deaths occur in low and middle income countries. Eighty five percent of all CVD deaths are due to heart attack

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and stroke. Low- and middle-income countries are disproportionally affected: over 80% of CVD deaths take place in low- and middle-income countries and occur almost equally in men and women. By 2030, almost 23.6 million people will die from CVDs, mainly from heart disease and stroke.[1,2]

Heart disease rate among Indians is double that of the national averages of the western world. This may be attributed to an underlying genetic predisposition to metabolic deregulation and cardiomyopathy as well as a recent shift of modifiable risk factors towards increasing consumption of red meats / saturated fats / trans-fats / junk foods and higher stress in sedentary people in India. Public health estimates indicate that India accounts for approximately 60% of the world's heart disease burden despite having less than 20% of the world's population.

Heart disease affect Indians at an earlier age,50% of all heart attacks in Indian men occur under 50 years of age and 25% of all heart attacks in Indian men occur under 40 years of age (almost 33% earlier) than other demographics, often without prior warning.[3]

Prevalence of cardiovascular risk factors increase substantially between the ages of 20 and 35. Alcohol consumption (31.7 %), excessive salt intake; elevated systolic blood pressure, raised BMI, cholesterol and blood sugar; type 2 Diabetic mellitus were found in early age.[4,5] At the same time the obesity and overweight are the risk factors responsible causing CVD among the young adults who are less active and spent >2 hours daily in front of television or computers, take daily calories above recommended dietary allowance (21.5% and 22.8% respectively), take junk food (9.3% and 14.8% respectively).[6,7] In India, CVD has become an important public health problem and one of the most important cause of mortality and morbidity which contributes substantially to the escalating costs of health care and massive economic burden.[8]

Most premature deaths can be avoided with modification of risk factors to reduce mortality and morbidity in people with diagnosed or undiagnosed CVD. Decisions about whether to initiate specific preventive action, and with what degree of intensity, should be guided by estimation of the risk of any such vascular event.[9] Reductions in the burden of modifiable CVD risk factors are estimated to contribute as much as 50% to the observed decrease in mortality from CVDs in high-income countries, reflecting a combined impact of population interventions to reduce risk factors and clinical treatment**.** The investigator felt the need to conduct a study to assess the risk factors of cardio vascular disease among college students.

Methods and Meterials

A descriptive cross sectional survey was carried among 207 undergraduate college students of Najath College of Science And Technology, Karuvarakundu, and Malappuram district of Kerala to assess the risk factors of cardiovascular diseases among college students. The objectives of the study were; 1. To collect background information of the subjects. 2. To identify the prevalence of modifiable risk factors like Weight, Blood pressure. 3. To identify the prevalence of behavioural risk factors like Tobacco-consumption, Alcohol-consumption, Physical inactivity and Unhealthy diet. Convenient sampling was used to collect the data.

A structured risk factor assessment Proforma was used to assess cardio vascular risk. It consisted 3 sections. **Section 1: Demographic characteristics** of college students. It included 10 items including age, sex, religion, type of family, stream of study, family income, educational status of father and mother, occupation of father and mother**.**

Section 2: Bio physical measurements; measurement of the samples were taken to identify Height, Weight**,** BMI**,** Blood Pressure.

- Height by using measuring tape.
- Weight by using digital weighing machine.
- BMI calculated with height and weight measurements.
- Blood pressure by using digital BP apparatus.

Section 3: **Behavioural risk assessment:** structured questionnaire was used to assess the modifiable risk factors. It consisted of 36 items related to behavioural risk factors like tobacco consumption, alcohol consumption, physical inactivity, unhealthy diet and psycho social factors

Scoring of risk factors: mild risk (**risk score** up

to 29), moderate risk (**risk score**30-48) and high risk (**risk score** 49 and above)**.** The possible score range was 12-95.

Content validity of tool:

To ensure the content validity the tool was submitted to 8 experts from the field of public health, cardiology and nursing. The experts were chosen based on their expertise, experience, qualification and interest in the problem area. The experts were requested to judge the items based on objectives, relevance and adequacy of the content organization, clarity, feasibility and appropriateness of items of the tool for the purpose of the study.

Most of the experts agreed on all items of the tool with slight modifications of some the items. The modifications were made as per the suggestions and tools were finalized.

Reliability of the tool: Reliability of the tool was established by various methods**.** For Structured risk factor assessment Proforma, KR 20 was used and it was found to be reliable with reliability coefficient 0.80. Similarly measuring tape, Weighing machine and Electronic BP apparatus were found to be reliable with reliability coefficient0.99, 0.98 and 0.99 respectively measured by the method of inter observer reliability.

Setting of the study: Najath College of Science And Technology, Karuvarakundu, Malappuram, Kerala.

The rationale for the selection of setting was: availability of subjects, feasibility of the study, familiarity of the setting, economy of time and money, convenience in terms of geographical aspects, administrative approval and expectation of cooperation for the study from various personnel.

The population comprised of under graduate college students.

Inclusion Criteria:

- College students of the selected college during the period of study.
- College students who are willing to participate.
- Availability of subjects during data collection.

Exclusion Criteria

- College students who were already diagnosed with any of cardio vascular disease.

Procedure for Data Collection

After obtaining the administrative and ethical approval from appropriate authority, the study was conducted among 207 college students from 5th October to 20th October 2018 at Najath College of Science and Technology. The researcher himself met the students in order to obtain a free and frank response; the students were explained about the nature of the study and their expected participation in the study. The subjects were assured about the confidentiality of their responses. The researcher took the measurements like height, weight, blood pressure and their responses for the survey filled by the students. The data was collected as per the validated tools. The data obtained was entered in a master sheet. The data was analysed and interpreted in terms of objective of the study using descriptive statistics like mean, percentage, frequency etc.

Results

Table: 1 Frequency distribution of sample characteristics. N=207.

Sample characteristics		Frequency	Percentage
Age in Years	18 -20 years	196	94.68%
	21-23 years	11	5.31%
	24-25 years	0	0
	above 26 years	0	0

Sex	Male	122	60%
	Female	85	40%
Religion	Hindu	22	10.62%
	Muslim	177	85.5%
	Christian	8	3.86 %
Stream of study	Science	35	17%
	Commerce	172	83.09%
	Arts	0	0
Family Income	<10,000	91	43.96%
	10,001, 20,000	73	35.26%
	20,001-30,000	32	15.45%
	30,001-above	11	5.31%
Type of Family	Nuclear family	125	60.38%
	Joint family	78	37.68%
	Single parent	4	1.93%
Educational Status of Father	Illiterate	0	0
	Primary school	35	16.90%
	High school	119	57.48%
	Higher secondary	27	13.04%
	Graduation	23	11.11%
	Post-graduation and above	3	1.44%
Educational Status of Mother	Illiterate	0	0
	Primary school	14	6.76%
	High school	136	65.70%
	Higher secondary	39	18.84%
	Graduation	15	7.24%
	Post-graduation and above	3	1.44%
Occupation of Father	Government job	10	4.83%
	Private job	74	35.74%
	Business	61	29.46%
	Agriculture	47	22.70%
	Un employed	15	7.24%
Occupation of Mother	home maker	189	91.30%
	Government job	7	3.38%
	Private job	6	2.89%
	Business	2	0.96%
	Agriculture	3	1.44%

Table-1 Shows that 94.6% of college students were in the age group of 18-20 years and 60% were male. Majority of the students (85%) were Muslim by religion. The 60% students had nuclear family whereas 37.8% students had joint family. Majority (91%) mothers were home makers.

Table- 2. Frequency distribution of BP and BMI of college students. N=207

Criteria	Statement	Total Frequency (%)	Frequency (%)	
			Male	Female
BMI	Under weight(BMI= <18)	57(27.53)	27(22.13)	30(35.29)
	Normal weight(BMI=18-24.9)	136(65.7)	83(68.03)	53(62.35)
	Overweight(BMI=25-29.9)	13(6.2)	11(5.31)	2(1.0)
	Obese(BMI=>30)	1(0.48)	1(0.48)	0(0)
Blood Pressure(mm Hg)	Normal (systolic<120, diastolic<80)	114(55.07)	59(48.36)	55(64.70)
	Elevated (systolic 120-129, diastolic <80)	46(22.22)	33(27.04)	13(15.29)
	Hypertension stage 1(systolic 130-139, diastolic 80-89)	35(16.90)	21(17.21)	14(16.47)
	Hypertension stage 2 (systolic >140, diastolic >90)	12(5.79)	9(7.37)	3(3.52)

Table-2 shows that 22.13% boys and 35.29% girls were underweight whereas only 0.48% male student was obese. Twenty seven percent boys and 15.29% girls had elevated Blood Pressure, 17.21% boys and 16.47% girls had hypertension stage 1 whereas 7.37% boys and 3.52% girls had hypertension stage 2.

Table. 3. Family history of selected chronic diseases. N=207

Statement	f (%)
Existing illness (Hypertension, DM, High Cholesterol, Kidney Disease)	2(1)
Family history of chronic illness	
Hypertension	78(37.68)
Diabetes	72(34.78)
Heart disease	45(21.73)
Stroke	6(3)

Table 3. Shows that 1% students had hypertension. The.68% students had family history of hypertension, 34.78% of diabetes mellitus type II, 21.73% heart disease and 3% students had family history of stroke.

Table 4. Tobacco & alcohol consumption and physical activity among college students. N=207

Variables		Frequency (Percentage)	
Tobacco consumption among the students		**Male**	**Female**
Type of smoker	Current smoker	15(7.24)	2(1)
	Non Smoker	107(51.6)	83(41)
Type of tobacco consumption	Non smoke Tobacco	29(14)	7(3.38)
Age of Initiation	<10 YR	1(0.48)	1(0.48)
	10-14 YR	4(2)	0(0)
	15-19	10(4.83)	1(0.48)
	>20 YR	0(0)	0(0)

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Number of Cigarettes Per Day	0-5	7(3.38)	1(0.48)
	6-10	4(2)	1(0.48)
	11-20	3(1.44)	0(0)
	>21	1(0.48)	1(0.48)
Passive Smoking		40(19.32)	26(12.56)
Alcohol consumption among the students			
Type of drinker	Current drinker	19(9.17)	7(3.38)
	Non drinker	90(43.47)	74(35.74)
	Past drinker	13(6.28)	2(1)
Frequency Of drinking	Daily	2(1)	0(0)
	3-4 Days in a week	5(2.41)	2(1)
	1-2 Days in a week	8(3.86)	3(1.44)
	Occasional	5(2.41)	1(0.48)
Quantity per drink	10-20 ml	1(0.48)	0(0)
	20-30 ml	4(2)	3(1.44)
	30-40 ml	6(2.9)	3(1.44)
	>40 ml	7(3.38)	1(0.48)
Age of initiation	<10 Year	1(0.48)	0(0)
	10-14 Year	5(2.41)	0(0)
	15-19 Year	13(6.28)	7(3.38)
According to physical activity among the students			
Sedentary		69(33.33)	60(28.98)
Moderate intense physical activity		38(18.35	31(15)
Vigorous intense activity		29(14	5(2.41)

Table-4 shows 7.24% male and 1% female students were current smokers. The 14% male students and 3.38% female students had habit of using non-smoke tobacco. Male (5.31%) and female (0.48%) students initiated smoking during the age of 15-19 years. The 3.38% male and 0.48% female students smoke up to 5 cigarettes per day. 19.32% boys and 12.56% had been exposed to passive smoking.

Regarding drinking habits among the students 9.17% boys and 3.38% girls had habit of drinking alcohol.

Boys (3.86%) and girls (1.44%) had habit of drinking 1-2 days in week. 2.9% boys, and 1.445girls had consumption of 30-40 ml alcohol while drinking. The majority (20) had initiated drinking during the age of 15-19 years. Further 33.33% boys and 28.98% girls were sedentary. The 18.35% boys and 15% girls were under moderate intense activity category.

Table 5- Frequency distribution of college students according to dietary practices. N=207

Variables		**Frequency (Percentage)**		**Total**
		Male	**Female**	**Frequency (%)**
Choice of Food	Vegetarian	0(0)	3(1.44)	3(1.44)
	Non-vegetarian	122(58.93)	82(39.61)	204(98.56)
Red meat consumption		64(30.91)	33(16)	97(46.85)
Eat green and green leafy vegetables daily		21(10.14)	17(7.24)	38(18.35)
Eat pulses daily		7(3.38)	18(8.7)	25(12)

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Eat one fruit daily	18(8.7)	18(8.7)	36(17.39)
Eat fast food daily	22(10.62)	9(4.34)	31(15)
Sprinkle extra salt	38(18.35)	33(16)	71(34.3)
Deep fried food consumption more than once in a week	65(31.40)	41(19.80)	106(50.24)
Cardio vascular disease risk (Max. possible score = 95)			
low risk(≤29)	56(27.05)	55(26.57)	111(54.10)
moderate risk(≤48)	56(27.05)	29(14)	85(40.57)
high risk(>49)	10(4.83)	1(0.48)	11(5.31

Table -5 shows that 98.56% students were non-vegetarian and 46.85% used to consume red meat among them.

The 18.35% students were using green and green leafy vegetable daily and 17.39% consume one fruit. The 15% students were using fast food daily and 34.3% students used extra salts in the diet. More than Half (50.24%) of the students used to consume deep fried food more than once in a week. The 27.05% boys and 14% girls were identified at moderate risk for developing cardio vascular diseases whereas 4.83% boys and only 0.485 were identified as in high risk.

Discussion

The present study found that 40.57% college students were at moderate risk and 5.31% were at high risk for developing cardio vascular disease. The risk was contributed to the risk factors and unhealthy behavior of the student as some modifiable risk factors like smoking, consumption of alcohol and sedentary life style can lead to develop CVD. The study reported that 7.24% male and 1% female students were smokers. The 3.38% male and 0.48% female students smoke up to 5 cigarettes per day. Nineteen percent boys and 12.56% had been exposed to passive smoking. The 9.17% boys and 3.38% girls had habit of drinking alcohol. Twenty seven percent boys and 15.29% girls had elevated Blood Pressure. Similar findings were reported by **Kumar SG, et al (2011)** wherein the prevalence of current smoking was found to be 22.4%. [18] Present study found Prevalence of Alcoholism among 12.56% students**.** Similarly **Khosla V, et al (2008)** found 31.1% prevalence of current use of alcohol among males.[10, 19] **Rustagi N, et al (2011)** reported that modifiable cardiovascular risk behaviors are widely prevalent among medical students and increase with years spent in the medical college.[11] Similarly **Kaur P, (2007)** indicated high prevalence of behavioral risk factors, central obesity, hypertension and diabetes in a select group of middle and high-income young urban males.[12]

Young adults are fond of fast food, non-vegetarian food and carbonated drinks. These unhealthy **dietary practices** and less physical activity are responsible for obesity, hypertension and cardiac problems. The present study found that 62.31% of the students were sedentary. Similar finding reported by **Singh H, et al (2017)** that11.37% were inactive, 73.73% were moderately active students.[13]

Present study reported that 98.56%students were non-vegetarian. The 46.85% were consuming red meat and 31% were using fast food daily. These finding are in consistent with **Saranya SV, et al (2016)** that consumption of eggs, fish, meat, and chicken was higher among male students whereas consumption of sweets and pastries was higher among the female.[14]

The study found that 6.2% students were overweight and 0.48% male was obese. Similarly, 5.38% school children were reported obeseby **Sandra Johnny, et al (2019).**[15] Obesity can develop hypertension in the people. Present study found prevalence of hypertension among 5.79% college students which in line with **Asharma, et al (2010)** that nearly 20% of the school children had elevated blood pressures.[16]

Family history of chronic illness like diabetes, hypertension and stroke, is a non-modifiable risk factor of cardio-vascular problem. The study found family history of chronic illness of 64.25% students who were suffering of CVD. **Vohra R, et al (2017)** found that CVD was present in a single family

member in 123 adolescents while 4 adolescents had more than 1 family member suffering from CVD.[17]

Conclusions

The study concluded that there should be some awareness programs regarding prevention of CVD among young adults. Promotion of supportive environment for strengthening student-based approaches and strategic delivery of health education is essential to target these risk behaviors like smoking, alcohol, sedentary life style, unhealthy dietary habits etc. Periodic screening and better control of risk factors like hypertension, hypercholesterolemia and diabetes are the key components to prevent the incidence of CVD. To prevent the premature mortality and morbidity, good management of acute and chronic events must be enforced effectively.

Limitation:

The present study was a cross sectional survey, conducted in a single setting with small sample size. This poses restriction to make a broader generalization. Standardized tool was not used in the present study because of non-availability. Therefore, self-developed tool was used.

Recommendations:

- Longitudinal studies can be conducted with a large sample size.
- A study can be conducted at hospital settings among patients diagnosed with cardio vascular disease regarding management of cardio vascular diseases.
- A similar study can be conducted in various other groups like office workers, teachers and high income groups etc.
- A comparative study may be conducted on samples drawn from urban and rural population.
- A KAP study can be conducted among college students towards prevention of cardio vascular diseases.

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