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Original Research Article

An epidemiological study of risk factors of cardiovascular diseases among medical students in a metropolitan city

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ABSTRACT

Background: Life-style related risk factors are mainly implicated for increased burden of cardiovascular diseases (CVDs) globally. In India, 21.1% total deaths in 2010 were due to CVDs. Compelling evidence shows that India stands to lose $2.17 trillion (of 2010 dollars) between 2012- 2030 due to CVDs. A study related to cardiovascular risk behaviour among medical students is essential, considering their role as future physicians and role models in public health intervention programs. There are very few studies among the budding physicians, especially in India.
Methods: This cross sectional study was carried out among 240 undergraduate MBBS medical students in a metropolitan city. Data was collected by using a semi-structured questionnaire consisting of close and open ended questions. Assessment of demographic profile, medical profile, alcohol use, dietary habits, physical activity and stress (PSS-10) was done. The data was entered in Microsoft Excel and analysed using SPSS 20 statistical software. Descriptive statistical measures like percentage, mean and standard deviations were calculated. An inferential statistical measure like Chi square was applied.
Results: Out of total 9 risk factors, the prevalence of ≤3 risk factors was 56.7% and >3 risk factors were 43.3%. 100% medical students had unhealthy dietary habits, 90.8% had stress, 59.6% had pre-hypertension/hypertension and 43.3% had insufficient physical activity. Gender and Hostel dwellers showed significant association with >3 risk factors.
Conclusions: All medical students had one or more risk factors which would lead to early onset of cardiovascular diseases in near future.

Keywords: Lifestyle, Risk factors, Medical students

INTRODUCTION

Life-style related risk factors are mainly implicated for increased burden of cardiovascular diseases globally. These risk factors develop early in life, at a young age and unless taken care of, often progress to give rise to chronic diseases like cardiovascular diseases (CVDs) over a period of years. In 2008 CVDs deaths represented 30% of all global deaths with 80% of those taking place in low and middle income countries.[1] Cardiovascular diseases are responsible for 10% DALYs in low and middle income countries.[2] In India, 21.1% total deaths in 2010 were due to CVDs.[3] CVDs are expected to be the fastest growing chronic illness in India by 2015 growing at 9.2% annually from 2000 onwards.[4]

CVDs include diseases of the heart, vascular diseases of the brain and diseases of blood vessels. Some common preventable risk factors underlie cardiovascular diseases. The major risk factors together account for approximately 80% of deaths from heart disease and stroke. The major modifiable behavioural risk factors are tobacco use,

harmful alcohol consumption, unhealthy diet (low fruit and vegetable consumption) and physical inactivity. The major biological risk factors are overweight and obesity, raised blood pressure, raised glucose, abnormal blood lipids and its subset raised total cholesterol. All these factors together create a domino effect, resulting in increased incidence of cardiovascular diseases.[5] The rationale for inclusion of these core risk factors is that they have the greatest impact on cardiovascular disease mortality and morbidity and modification is possible through effective prevention at an early stage.

The stark observation of reviewing previous studies showed the rising incidence of cardiovascular diseases in younger age groups. This means that India's productive population is getting affected causing an economic setback to the country. Compelling evidence shows that India stands to lose $2.17 trillion (of 2010 dollars) between 2012- 2030 due to CVDs.[6]

A study related to cardiovascular risk behaviour among medical students is essential, considering their role as future physicians and role models in public health intervention programs. As far as a physician is concerned, there is evidence that such lifestyle related behavioural risk factors during medical school predicts later problems in terms of personal suffering of individual doctor and negative impact on patient care. Although many research papers have been published on cardiovascular risk behaviour among young (students), there are very few which study these in budding physicians, especially in India. Hence, the current study was undertaken with the aim to assess the risk factors of cardiovascular diseases among the Medical students in a metropolitan city.

METHODS

Study design

This was a cross sectional study done among MBBS undergraduate students of Topiwala National Medical College in Mumbai city from January 2016 to December 2016.

Inclusion and exclusion criteria

Undergraduate students studying in 1st, 2nd, 3rd, 4th, 5th, 8th and 9th semesters of MBBS course and who gave the consent were included in the study. Undergraduate students studying in 6th and 7th semesters were excluded for academic reasons.

Sample size

The strength of all the undergraduate M.B.B.S students in the Medical College was 600. From among these the undergraduate students studying in 6th and 7th semesters were excluded to avoid any participant based bias due to academic reasons thus, reducing the number of students to 480 out of which 50% students were selected for this study by systematic random sampling. Therefore, sample size was 240.

Study tool

Data was collected after taking written informed consent by using a pre-tested semi-structured questionnaire consisting of close and open ended questions. Assessment of demographic profile, academic performance, alcohol and substance abuse history, dietary habits, physical activity, and stress (PSS-10) was done. Parameters measured were blood pressure, weight, height, BMI, waist circumference, socioeconomic status, dietary habits, addictions and stress level.

Statistical analysis

The data was entered in Microsoft Excel and analysed using SPSS 20 statistical software. Descriptive statistical measures like percentage, mean and standard deviations were calculated. An inferential statistical measure like Chi square was applied.

RESULTS

The mean age of medical students was 20.31±1.49 years, 154 (64.2%) were female and 86 (35.8%) were male, Hindu religion was followed by 206 (85.8%), Jain religion by 11 (4.6%), Buddhism by 9 (3.8%), Christianity by 8 (3.3%) and Muslim religion by 6 (2.5%). 199 (82.9%) were hostel dwellers and 41 (17.1%) were day scholars. 60 (25.0%) were in the first year, 120 (50.0%) were in second year and 60 (25.0%) were in the third year of MBBS course. Using modified BG Prasad socioeconomic status classification for 2013, 189 (78.7%) belonged to class I, 35 (14.6%) belonged to class II and 6 (2.5%) belonged to class III, 4 (1.7%) belonged to class IV and 6 (2.5%) belonged to class V (Table 1).

Individual risk factors observed were present as positive family history in 51 (21.3%) medical students, alcohol use in 28 (11.7%) medical students, smoking in 3 (1.3%) medical students and tobacco chewing habit in 3 (1.3%) medical students. Unhealthy diet as risk factor was present in 240 (100.0%) medical students, insufficient physical activity in 104 (43.3%) medical students, stress in 218 (90.8%) medical students, obesity in 43 (17.9%) medical students and high blood pressure (pre-hypertension and hypertension) in 143 (59.6%) medical students (Table 2).

Among the 240 medical students, 3 (1.3%) were having 1 Risk factor, 33 (13.8%) were having 2 risk factors, 100 (41.7%) were having 3 risk factors, 69 (28.6%) were having 4 Risk factors, 26 (10.8%) were having 5 Risk factors, 5 (2.1%) were having 6 risk factors and 4 (1.7%) were having 7 risk factors. Thus, all the medical students had one or more risk factor. No medical student was without any risk factor (Table 3).

Table 1: Demographic profile of the medical students (n=240).

Demographic profile		Frequency (n)	Percentage (%)
Age (years)	18 to 19	60	25
	20 to 21	101	42.1
	22 to 23	60	25
	24 to 25	19	7.9
Sex	Female	154	64.2
	Male	86	35.8
Religion	Buddhism	9	3.8
	Christian	8	3.3
	Hindu	206	85.8
	Jain	11	4.6
	Muslim	6	2.5
Residence	Day scholar	41	17.1
	Hostel dweller	199	82.9
Class	First year	60	25
	Second year	120	50
	Third year	60	25
Socio-economic class	Class I	189	78.7
	Class II	35	14.6
	Class III	6	2.5
	Class IV	4	1.7
	Class V	6	2.5

Table 2: Distribution as per individual risk factor in the medical students.

Risk factor		Frequency (n)	Percentage (%)
Family history	No	189	78.7
	Yes	51	21.3
Alcohol use	No	212	88.3
	Yes	28	11.7
Smoking habit	No	237	98.7
	Yes	3	1.3
Tobacco chewing habit	No	237	98.7
	Yes	3	1.3
Unhealthy diet	No	0	0.0
	Yes	240	100.0
Insufficient physical activity	No	136	56.7
	Yes.	104	43.3
Stress	No	22	9.2
	Yes	218	90.8
Obesity	No	197	82.1
	Yes	43	17.9
High blood pressure	No	97	40.4
	Yes	143	59.6

Table 3: Distribution of total number of risk factors in the medical students.

Total number of risk factors	Frequency (n)	Percentage (%)
0	0	0.0
1	3	1.3
2	33	13.8
3	100	41.7
4	69	28.6
5	26	10.8

Continued.

Total number of risk factors	Frequency (n)	Percentage (%)
6	5	2.1
7	4	1.7
8	0	0.0
9	0	0.0
Total	240	100.0

Table 4: Associations between demographic variables and number of risk factors.

Variables		Number of risk factors		Total	Chi square value	P value
		0 to 3 N (%)	4 to 7 N (%)			
Age Group	18 to 21	90 (55.9)	71 (44.1)	161	0.117	0.732
	22 to 25	46 (58.2)	33 (41.8)	79		
Class	First year	33 (55.0)	27 (45.0)	60	0.814	0.665
	Second year	66 (55.0)	54 (45.0)	120		
	Third year	37 (61.7)	23 (38.3)	60		
Sex	Female	97 (63.0)	57 (37.0)	154	6.991	0.008
	Male	39 (45.3)	47 (54.7)	86		
Religion	Hindu	117 (56.8)	89 (43.2)	206	0.010	0.921
	Others	19 (55.9)	15 (44.1)	34		
Socio-economic status	High	132 (57.4)	98 (42.6)	230	0.578*	0.447
	Low	4 (40.0)	6 (60.0)	10		
Residence	Day scholar	13 (31.7)	28 (68.3)	41	12.545	0.000
	Hostel dweller	123 (61.8)	76 (38.2)	199		
Sleep time	Adequate	131 (56.0)	103 (44.0)	234	0.842*	0.359
	Inadequate	5 (83.3)	1 (16.7)	6		
Medical history	Hypertension	2 (50.0)	2 (50.0)	4	0.074*	0.786
	No	134 (56.8)	102 (43.2)	236		

*With Yates correction.

It was observed that females (57) were having more risk factors compared to male (47) and showed significant statistical association. Also, hostel dwellers (76) had more risk factors compared to day scholars (28) and showed significant statistical association (Table 4).

DISCUSSION

It was observed that majority of medical students were having moderate to high level of stress which is detrimental to health. Lower level of stress was observed by Giri et al in medical students from Nepal where 104 (65.4%) medical students felt stressed out due to medical studies and 55 (34.6%) medical students did not feel stressed out due to medical studies.[7] Reports from different parts of the world have shown medical education to be stressful. The Columbia experience states that on average 10-15% students seek consultation and 1/3rd need therapy to deal with conflicts in their personal life.[8]

Among 240 medical students, 212 (88.3%) did not consume alcohol, 25 (10.4%) consumed alcohol rarely and 3 (1.3%) consumed alcohol 1-2 times/week. Current alcohol users were 10.3% in a study by Amruth and 14% college students in a study by Nair.[9,10]

Smoking habit was observed in only 1.3% medical students which is an encouraging finding. However, other studies reported higher percentage of smoking among medical students.[9,10]

Lower intake of fruits and vegetables was reported among all 240 (100.0%) students. Other studies reported a higher intake of fruits and vegetables. In a study by Bundela it was found that only 21.43% of boys and 32.84% of girls were consuming 5 or more servings of fruits and vegetables per day and in a study by Amruth it was found that 50.7% medical students consumed less than 3 servings per day of vegetables and 54.1% medical students consumed less than 2 servings per day of fruits.[9,11] This variation in the consumption of fruits and vegetables can be due increased preference for instant food like noodles, fast food and dislike for vegetables. Also, the lack of availability of fruits and vegetables for medical students staying especially in hostel facilities must be considered as an important cause of less consumption of fruits and vegetables.

Among the 240 medical students, 51 (21.25%) had family history of Hypertension. This is slightly higher than the study by Kulkarni where out of total 120 students, 12 (6%) and 16 (8%) students reported family history of

diabetes mellitus and hypertension respectively.[12] In a study by Kurian family history of CAD was present in 12% of subjects which is slightly lower than the present study.[13]

Among the 240 medical students, 139 (57.9%) indulged in some form of physical activity and 101 (42.1%) did not indulge in any form of physical activity. Similar finding was reported by Bundela where 24.47% boys & 46.26% girls were not doing any kind of physical activity at all.[11] As per recommendation no exercise or sports was observed in 163 (35.6%) medical students in South India in a study by Paul et al which is lower than the present study.[14]

Pre-hypertension/ hypertension was observed in 143 (59.6%) in present study. Lower occurrence of pre-hypertension/ hypertension was observed in other studies. Pre-hypertension/ hypertension was observed in 124 (27.1%) medical students in South India in a study by Paul et al and in 9.0% male and 12.5% female in a study by Jain et al.[14,15]

43 (17.9%) medical students were obese in the current study. Prevalence of overweight was observed by Amruth et al in 21.3% students, by Giri et al in 15.7% of the students and by Paul et al in 24.7% medical students.[7,9,14]

Thus, the prevalence of risk factors was found to be 100.0% in the present study with all medical students having unhealthy diet as the common risk factor for cardiovascular diseases, followed by stress in 90.8% medical students, pre-hypertension/ hypertension in 59.6% and insufficient physical activity in 43.3% medical students.

CONCLUSION

All medical students had one or more risk factors that can lead to early onset of cardiovascular diseases in near future which can be easily prevented by taking appropriate life style related measures during their medical studies. The very high prevalence of risk factors among medical students observed must be addressed effectively by early impartation of information and knowledge about risk factors for cardiovascular diseases to medical students from the first year itself.

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