



Original Research Article

Assessment of Life Style Associated Behavioural Risk Factors for Cardiovascular Diseases among Medical Students in Assam, India

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Received: 13/07/2015

Revised: 28/07/2015

Accepted: 29/07/2015

ABSTRACT

Background and objectives: In modern world life style related risk behaviours are causing concern for increased burden of cardiovascular diseases. Medical students are inherently vulnerable to CVD due to rapidly changing life style caused by recent technological advancement and globalization. An attempt was made to assess the behavioural risk factors for CVD prevailing among the medical students and to find out their awareness of these risk behaviour at the time of pursuing their MBBS course.

Methods: A descriptive cross-sectional study was conducted among 280 undergraduate medical students of Jorhat Medical College, Jorhat, Assam.

Results: In the present study the overall prevalence of current tobacco and alcohol users among the MBBS students was found to be 25.4%. Male students reported significantly higher use of tobacco 45.8%, and alcohol 46.5% than females. 41.4% students were exposed to passive smoking. Sedentary lifestyles were recorded in 81.8% students and only 42.9% were physically active. Adequate fruit and vegetable intake was fulfilled by 18.9% & 30.7% students respectively. Students reported for frequent intake of fast food were 63.6% in past week whereas 61.1% were taking carbonated drink ≥ 1 time per day in past month. Added salt was reported by 38.2% and stress present in 52.5% students. 96.8% were aware of the risk factors and 38.2% students had family history of CVD.

Conclusion: Risk factors of CVD are present among the medical students. This warrants the need to develop strategies for health promotion which can promote healthy lifestyle among the future health care providers.

Keywords: Cardiovascular Diseases, Behavioural Risk Factors, Medical College, Students.

INTRODUCTION

Cardiovascular diseases (CVD) are the major contributor to the burden of chronic diseases. It is expected that by 2020, CVD would prevail as the leading cause of death and disability over infectious diseases globally. ⁽¹⁾

Earlier, increased prevalence of CVDs was experienced in developed countries but now it is increasing in developing countries like India because of epidemiological transition and adoption of western life-style like low physical activity,

intake of energy dense food and substance abuse like tobacco and alcohol. ⁽²⁾

India alone is burdened with approximately 25% of cardiovascular-related deaths. ⁽³⁾ The huge burden of CVD in Indian subcontinent is the consequences of large populations and high prevalence of cardiovascular risk factors. ⁽⁴⁾ The risk factors include smoking, alcohol, low fruit and vegetable intake, physical inactivity, obesity, high blood pressure and abnormal lipids. ⁽⁵⁾

Although cardiovascular diseases typically occur in middle age or later, risk factors are determined to a great extent by behaviours learnt in childhood and continued into adulthood, such as dietary habits and smoking. Throughout the world, these risks are starting to appear earlier. ⁽⁶⁾

Life style related risk behaviours are mainly implicated for the increased burden of cardiovascular diseases. To achieve the goal of preventing cardiovascular diseases it is important to avoid the occurrence of the major risk factors themselves. ⁽⁷⁾

Medical students are generally in the age group 17-25 years. This is the time when lifestyle patterns, both healthy and unhealthy, are formed. ⁽⁸⁾ It is generally expected that medical students would practice healthy dietary habits and physical activity compared to non-medical students. But studies have found that despite adequate knowledge, medical students exhibit poor dietary practices and low physical activity. ⁽⁹⁾ Moreover, considering the role of medical students as future physician and role model for the general population it is essential to know the status of these risk factors amongst them. This will enable the policy makers to initiate appropriate containment strategy to curb this rising life style disorder. Hence, the present study was undertaken to assess the burden of life style related behavioural risk factors for CVD amongst the medical students and to find out their awareness for

these risk behaviour at the time of pursuing their MBBS course.

MATERIALS AND METHODS

Present cross-sectional observational study was conducted among 280 undergraduate medical students of Jorhat Medical College, Jorhat, Assam during the months of July –August, 2014 after the necessary administrative approval. Jorhat Medical College is a new Medical College of Assam established in 2010 with a total of 4 batches and a yearly intake of 100 students per academic session. The participants were from second, third and final year of MBBS course. They were approached in their classes and the purpose of the study was briefed. After explaining the aims and objectives of the study, verbal informed consent was taken. Participation in the study was voluntary. A pre designed, pre tested, structured and self administered questionnaire which was distributed among the students for data collection. They were given 15 minutes to answer the questions and independent opinion was obtained. The respondents were asked not to mention their names and roll numbers for maintaining anonymity in order to encourage participation and elicit correct response. Confidentiality of information was ensured.

Information was gathered on socio-demographic variables and on life style associated behavioural risk factors for cardiovascular diseases. Consumption of any form of tobacco (smoking/smokeless) or alcohol in past 30 days was enquired. History of exposure to passive smoking in past one week was also ascertained. Dietary practices were assessed by asking questions on diet preferences, consumption of fruits, vegetables, fast foods, carbonated drinks and extra salt intake. Physical activity was ascertained by asking for physical activity (running, fast walking, dancing, biking) carried out in last week and hours spent in

sedentary activity on a typical day was assessed. Students with physical activity of at least 30min/day for 2 or less days in the past week were classified as inactive and for 3 or more days as active. Sedentary behaviour was taken as students spending 3 hours or more on a typical day in sitting activities like watching TV/playing computer& video games. Family history of any cardiovascular diseases in parents or grandparents and stress felt in any way by the students (subjective) was asked for.

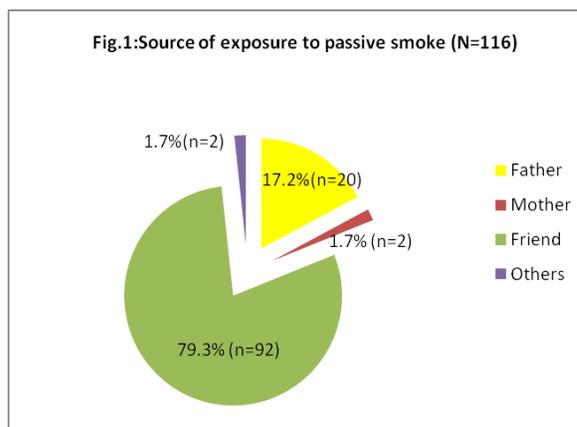
Out of a total 300 MBBS students, questionnaires could be distributed to 280 students and those absent on the day of interview were excluded from the study. Statistical analysis was done using SPSS trial version 16. It comprised calculating proportion, mean and standard deviation. Association between independent factors and dependent factors was determined using chi-square test with Yates correction. *P*-value < 0.05 was considered significant for all tests.

RESULTS

A total of 280 students participated in the study. 92 (32.9%) students were in 2nd year, 93 (33.2%) were in 3rd year and 95(33.9%) were in Final year of their MBBS course. The age of the students ranged from 19-24 yrs with a mean age of 21.81 ± 1.07 years. Males comprised a slightly higher number 144(51.4%) than females 136(48.6%). Most of the students, 278(99.3%) were residing in hostel within the premises of the medical college. Majority 253(90.4%) belonged to nuclear families and 234(83.6%) were Hindus. Family history of any CVD was reported by 107(38.2%) students. (Table 1)

Table 1: Socio-demographic characteristics of the respondents

Characteristics	Number(n=280)	Percentage (%)
YEAR OF STUDY		
2 nd year	92	32.9
3 rd year	93	33.2
Final year	95	33.9
SEX		
Male	144	51.4
Female	136	48.6
RESIDENCE		
Hostel	278	99.3
Home	2	0.7
FAMILY TYPE		
Nuclear	253	90.4
Joint	27	9.6
RELIGION		
Hindu	234	83.6
Muslim	39	13.9
Christian	7	2.5
FAMILY HISTORY OF CVD		
Present	107	38.2
Absent	173	61.8



Tobacco and Alcohol use: The overall prevalence of current tobacco users among the MBBS students was found to be 25.4%. The similar percentage 25.4% was also recorded in case of alcohol users. The prevalence reported to be higher in male for use of both tobacco products and alcohol (45.8%, 46.5%) in comparison to females (3.68%, 2.94%) ($\chi^2 = 65.67$, *p* < 0.05) ($\chi^2 = 70.20$, *p* < 0.05) respectively.

116 (41.4%) students were exposed to passive smoking in the past seven days and majority of them 92(79.3%) cited their friend as the source of exposure to passive smoke (Fig. 1). Exposure to passive smoke was observed to be higher among males

(70.8%), compared to 10.3% in females ($\chi^2 = 105.64$, $p < 0.05$). (Table 2)

Diet Patterns: Most of the students 70.4% reported to be had non-vegetarian food regularly, while 29.6% were vegetarian. Inadequate intake (≤ 3 times/week) of vegetables and fruits was found to be more common in 69.3% and 81.1% students respectively. Among the inadequate intake of vegetables 70.6% were female while 68.1% were male. On the other hand it was observed that 84.0% male students had reported as inadequate intake of fruits in comparisons to among females 77.9%.

Majority, 171(61.1%) of the respondents had taken carbonated drinks (≥ 1 time/day) in past 30 days. This was observed to be higher among males (74.3%), compared to 47.1% females ($\chi^2 = 21.84$, $p < 0.05$).

63.6% students had consumed fast food (≥ 3 times/week) and this was also observed to be higher among males 72.9% than females 53.7% ($\chi^2 = 11.18$, $p < 0.05$).

Added salt intake was reported by 38.2% students of which slightly higher intake was

found among males 38.9%, compared to 37.5% among females ($\chi^2 = 0.057$, $p > 0.05$). (Table 2)

Physical and Sedentary activity: It was found that 57.1% students were physically inactive. Physical inactivity was observed to be higher among females (68.4%), compared to 46.5% males ($\chi^2 = 13.64$, $p < 0.05$). Most of the students (81.8%) had sedentary lifestyle, i.e. activities involving sitting for ≥ 3 hours/day and in this category also females showed slightly higher (83.1%) sedentary lifestyle than males (80.6%) ($\chi^2 = 0.30$, $p > 0.05$). (Table 2)

Stress: Self perceived stress was reported by 52.5% students. Of which it was observed to be higher among females (58.8%), compared to 46.5% males ($\chi^2 = 4.24$, $p < 0.05$). (Table 2)

Awareness of Risk factors: Majority 271(96.8%) of the students were aware of the risk factors related to cardiovascular diseases and the awareness level increased with their year of study ($\chi^2 = 6.39$, $p < 0.05$). (Table 3)

Table 2: Summary of Risk factors for cardiovascular disease:

Risk factors	Status	Male (n=144) (%)	Female (n=136) (%)	χ^2 Value	P value*
Tobacco use (past 30 days)	Present	66(45.83)	5(3.68)	65.674	p=0.000
	Absent	78(54.17)	131(96.32)		
Alcohol use (past 30 days)	Present	67(46.53)	4(2.94)	70.204	p=0.000
	Absent	77(53.47)	132(97.06)		
Passive smoke exposure (past 7 days)	Present	102(70.83)	14(10.29)	105.64	p=0.000
	Absent	42(29.17)	122(89.71)		
Intake of Vegetables	>3 times/ week	46(31.94)	40(29.41)	0.211	p=0.646
	≤ 3 times/ week	98(68.06)	96(70.59)		
Intake of fruits	>3 times/ week	23(15.97)	30(22.06)	1.689	p=0.194
	≤ 3 times/ week	121(84.03)	106(77.94)		
Added salt	Taken	56(38.89)	51(37.50)	0.057	p=0.811
	Not Taken	88(61.11)	85(62.50)		
Intake of Fast food	<3 times/ week	39(27.08)	63(46.32)	11.180	p=0.001
	≥ 3 times/ week	105(72.92)	73(53.68)		
Carbonated drink taken (≥ 1 time/day)past 30 days	Yes	107(74.31)	64(47.06)	21.841	p=0.000
	No	37(25.69)	72(52.94)		
Stress	Present	67(46.53)	80(58.82)	4.240	p=0.039
	Absent	77(53.47)	56(41.18)		
Physical activity (30 mins/day)	≥ 3 days/ week	77(53.47)	43(31.62)	13.641	p=0.000
	<3 days/ week	67(46.53)	93(68.38)		
Sedentary Lifestyle	Present	116(80.56)	113(83.09)	0.301	p=0.583
	Absent	28(19.44)	23(16.91)		

(*p value < 0.05 is significant; p value > 0.05 is not significant)

Table 3: Awareness level with the year of study of the students:

YEAR OF STUDY	AWARENESS		χ^2 Value, p value*
	PRESENT	ABSENT	
2 nd year (n=92)	86(93.5)	6(6.5)	$\chi^2=6.390$, df=2, p=0.041
3 rd year (n=93)	90(96.8)	3(3.2)	
Final year (n=95)	95(100)	0(0)	
Total (n=280)	271(96.8)	9(3.2)	

(*p value <0.05 is significant)

DISCUSSION

The present study was a cross sectional study undertaken to assess the burden of life style related behavioural risk factors for CVD amongst the medical students and to find out their awareness for these risk behaviour at the time of pursuing their MBBS course.

Over all prevalence of tobacco use as documented by the present study was 25.4% which is higher than the findings revealed in other studies. (10, 11) However, a finding on alcohol intake was similar. (10, 11) In our study, significantly higher level of prevalence was found in males than females for consumption of tobacco and alcohol. Similar finding was also documented by Rustagi et al. (11) this observed gender difference may be due to prevailing socio-cultural norms in the society. Our study also revealed that 70.8% males and 10.3% females were exposed to passive smoke. Friends were the major source of exposure to passive smoke. This finding is a matter of concern as students spend more time with friends and can be easily influenced by them.

Regarding dietary habit, fruits and vegetables play an important role in promoting health. Adequate fruit and vegetable intake was reported only by 18.9% and 30.7% students respectively. Similar low intake of fruits and vegetables was also observed in studies by Akheel et al, Rustagi et al. (10, 11) Moreover, our study documented no significant differences in the intake of fruits and vegetables between males and females.

Fast food and carbonated drinks are now a day's priority over the home cooked traditional foods and thus depriving individual of adequate nutrients, loading them with more calories and fat. In our study 63.6% respondents had consumed fast food ≥ 3 times/week and intake of carbonated drinks was 61.1%. Significantly higher intake of both fast food and carbonated drinks was reported among males than females. Similarly, Srivastava et al in their study reported significantly higher intake of carbonated drink among males than females. However, fast food consumption was reported to be higher among females than males and the difference was not significant. (12) On the contrary, Galhotra et al in their study reported significantly higher intake of carbonated drink among females than males. (13)

In our study 38.2% of students were taking extra salt .Salt intake pattern did not vary much between males and females which was also observed by Srivastava et al though the extra salt intake was only (22.3%). (12) However, Rustagi et al in their study reported higher salt intake (53.0%) among the students. (11) Unhealthy dietary practices as observed in our study may be due to poor health conscious and less parent's supervision as most of the students stay in the hostel.

Stress is a well documented risk factor for CVD. (14) In our study it was present in 52.5% students and was found significantly higher among females than males. Study conducted among Pakistani medical students also reported higher degree of stress varying from mild to severe. (15) Medical education seems to be stressful course considering its wide diversity to be completed within limited time span. Thus medical students are predisposed to psychological stress which is widely

believed to be important determinant of heart disease. ⁽¹⁶⁾

Physical activity is a major determinant of health. Regular Physical activity improves physical fitness, reduces the risk of developing chronic diseases and disability. It helps in prevention of unhealthy weight gain. Only 42.9% students were physically active of which males documented significantly higher activity than females. A similar finding was observed in the studies conducted by Srivastava et al, Aslam et al. ^(11, 15) Mani G also reported low physical activity in her study among medical students. ⁽¹⁷⁾

In our study, 81.8% students had sedentary lifestyle and did not differ significantly ($p>0.05$) according to gender. Long hours of sedentary work (62%) were reported in other study carried out among university students. ⁽¹⁸⁾ On the contrary, Srivastava et al reported lower sedentary lifestyle among students; however males had higher sedentary lifestyle than females. ⁽¹²⁾ Breaks during continued sedentary activity (i.e., standing up, walking down the hall, and others), regardless of physical activity level have been reported to reduce a number of individual CVD risk factors. ⁽¹⁹⁾ Hence the importance of performing light activities (e.g., walking/standing) in between long sedentary hours should be emphasized among the students. Awareness about the risk factors was high in our study and this increased with the year of study of the students. Similar finding was also observed in the study conducted by Akheel et al ⁽¹⁰⁾

CONCLUSION

Present study revealed that lifestyle related behavioural risk factors for CVDs are widely prevalent among the medical students. Males reported to be significantly higher prevalence of most of the risk factors like tobacco use, alcohol use, passive smoke exposure, fast food and carbonated drink

intake than females. The influencing factors responsible for these high risk life style associated behaviour needs to be explored in near future so that appropriate measures can be taken by the medical colleges based on the findings. Primary prevention may be one way to lower these risk burdens of CVD. An early intervention in medical students has a positive effect on their health behaviour and thereby promotes healthy lifestyle. Promotion of supportive environment within the college premises and strategic delivery of health education is essential to target these risk factors among the future doctors so that they become more productive health care provider for the masses.

ACKNOWLEDGEMENTS

The authors would like to acknowledge the Principal, Jorhat Medical College for providing permission to carry out the present study. Thanks are due to all the undergraduate medical students of Jorhat Medical College for their participation in the current research as study participants.

Conflict of Interests: The authors declare that they have no conflict of interests.

REFERENCES

1. Murray CJ, Lopez AD.1997. Alternative projections of mortality and disability by cause 1990-2020: Global Burden of Disease Study. *Lancet* .349:1498-504.
2. Reddy KS. 2002. Cardiovascular diseases in developing countries: dimensions, determinants, dynamics and directions for public health action. *Public Health Nutrition*: 5(1A), 231-237.
3. Gupta R, Joshi P, Mohan V, Reddy KS, Yusuf S. 2008.Epidemiology and causation of coronary heart disease and stroke in India. *Heart* .94: 16- 26.
4. Goyal A, Yusuf S.2006.The burden of cardiovascular diseases in the Indian subcontinent, *Indian Journal Med Res*. 126: 235-244.

5. Bonita R, Courten M, Dwyer T et al. 2001. Surveillance of Risk Factors for Non-communicable diseases. WHO STEP Wise Approach, Geneva: WHO 2001.
6. Yadav KD, Wagle RR. 2012. Knowledge and Attitude Regarding Major Risk Factors of Cardiovascular Diseases among 15-19 Year Old Students of Kathmandu District. *Health Prospect*. 11:7-10.
7. Agrawal VK, Basannar DR, Sing RP et al. 2006. Coronary Risk Factors in a Rural Community. *Indian Journal of Public Health*. 50(1):19-23.
8. Gupta AK, Mazta SR, Kumar S, Joshi I. 2012. Prevalence of use of Tobacco among Male Medical Students in IGMC Shimla, Himachal Pradesh, India. *JIMSA*. 25(4):241.
9. Jalwar KK, Grover A, Thakur JS. 2011. Role of Medical Education in preventing and control of Non communicable Diseases in India. *Indian Journal of Comm Medicine*. 36:63-66.
10. Akheel MM, Mubashir BA, Dixit MD. 2012. Prevalence of risk factors of ischemic heart disease among students of J N Medical College in Belgaum, Karnataka, India. *Global Journal of Medicine and Public Health*. 1(3):24-26.
11. Rustagi N, Taneja DK, Mishra P, Ingle GK. 2011. Cardiovascular Risk Behavior among Students of a Medical College in Delhi. *Indian Journal of Comm Medicine*. 36(1):51-53.
12. Srivastava A, Sharma M, Gupta S, Saxena S. 2013. Epidemiological investigation of lifestyle associated modifiable risk factors among medical students. *National journal of Medical Research*. 3(3): 210-215.
13. Galhotra A, Abrol A, Agarwal N, Goel N, Gupta S. 2009. Life Style Related Risk Factors For Cardiovascular Diseases In Indian Adolescents. *The Internet Journal of Health*. 9 (2).
14. Rozanski A, Blumenthal JA, Kaplan J. 1999. Impact of psychological factors on the pathogenesis of cardiovascular disease and implications for therapy. *Circulation*. 99:2192-2217.
15. Aslam F, Mahmud H, Waheed A. 2004. Cardiovascular Health - Behaviour of Medical Students in Karachi. *Journal of Pakistan Medical Association*. 54(9):492-495.
16. Everson SA, Lynch JW, Chesney MA et al. 1997. Interaction of workplace demands and cardiovascular reactivity in progression of carotid atherosclerosis: population based study. *BMJ*. 314(7080): 553-558.
17. Mani G. 2014. Assessment of Body Mass Index and its Associated Nutritional Factors Among Undergraduate Medical Students in Tamil Nadu, India: A Cross-Sectional Study. *J Pioneer Med Sci*. 4(3):137-142.
18. Irwin JD. 2007. The prevalence of physical activity maintenance in a sample of university students: A longitudinal study. *J Am Coll Health*. 56:37-41.
19. Healy GN, Dunstan DW, Salmon J et al. 2008. Breaks in sedentary time: beneficial associations with metabolic risk. *Diabetes Care*. 31:661-666.

How to cite this article: Bahety H, Das BR, Das N et. al. Assessment of life style associated behavioural risk factors for cardiovascular diseases among medical students in Assam, India. *Int J Health Sci Res*. 2015; 5(8):1-7.
