Research Article

Assessment of awareness about cardiovascular disease risk factors and association between overweight and family history of cardiovascular disease among first-year medical students of a medical college in Karnataka

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Abstract

Background: It is estimated in WHO Noncommunicable Diseases (NCD) Country Profiles 2011 that NCD account for 53% of all deaths. Of which, 24% are due to cardiovascular diseases (CVDs) alone. Lifestyle-related behavioral risk factors are mainly implicated among medical students.

Objectives: To assess the awareness about CVD risk factors; to measure the cardiovascular risk behaviors using structured questionnaire; and to find the association between overweight and family history of CVDs among first-year medical students.

Materials and Methods: A cross-sectional study was carried out among first-year medical students of Shridevi Institute of Medical Sciences & Research Hospital, Tumkur, Karnataka, India. A self-administered structured questionnaire was used to obtain information. The study period was from March 2014 to May 2014. The data analysis was done using SPSS software, version 17. χ2-test and unpaired t-test were used.

Results: The study subjects were 146 first-year medical students belonging to 17–22 year age group. There was lack of awareness about CVD risk factors. CVD risk behaviors were highly prevalent among medical students. Students with family history of CVDs had higher mean body mass index (22.61 vs 21.44 kg/m^2, $P < 0.05$) than those without family history of CVDs. The association between overweight and family history of CVDs among students was statistically significant ($P < 0.05$).

Conclusion: Lack of awareness about CVD risk factors and unhealthy behavioral practices are prevalent among first-year medical students and may progress as students advance through medical college. Behavior change communication and health education strategies are essential.

KEY WORDS: Awareness, cardiovascular, risk factors, family history, medical students

Introduction

It is estimated in WHO Noncommunicable Diseases (NCD) Country Profiles 2011 that NCDs account for 53% of all deaths in India. Of which, 24% are due to cardiovascular diseases (CVDs) alone.[1]

CVDs are the number one cause of death globally. More people die annually from CVDs than from any other cause. An estimated 17.3 million people died from CVDs in 2008, representing 30% of all global deaths. Of these deaths, an estimated 7.3 million were due to coronary heart disease (CHD) and 6.2 million were due to stroke. Low- and middle-income countries are disproportionally affected with over 80% of deaths caused due to CVDs and occur almost equally in men and women. By 2030, globally almost 23.6 million people will die from CVDs, mainly from heart disease and stroke. These are projected to remain the single leading cause of death.[2]

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The major CVDs are coronary artery disease, hypertension, cardiomyopathy, heart failure, cor pulmonale, cardiac dysrhythmia, inflammatory heart diseases, diabetic vasculopathy, valvular heart disease, stroke and cerebrovascular disease, and peripheral arterial disease.

Some of the modifiable risk factors account for a great majority of deaths and for a significant proportion of the disease burden due to chronic NCDs. Among these factors are smoking, physical inactivity, and dyslipidemias (associated mainly with excessive consumption of fats of animal origin).[3]

CVDs are increasing nowadays among the medical professionals. Lifestyle-related behavioral risk factors are mainly implicated for this increased burden, 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. Thus, this study was carried out with the objective to assess the awareness about CVD risk factors and to measure the cardiovascular risk behaviors using a structured questionnaire and to find out the association between body mass index (BMI) and family history of CVDs among first-year medical students.

Materials and Methods

A cross-sectional study was conducted among first-year medical students of Shridevi Institute of Medical Sciences & Research Hospital, Tumkur district, Karnataka, India. The study period was from March 2014 to May 2014.

Of 150 first-year medical students, 146 belonging to 17–22 year age group who were willing to participate were included as study subjects. Those who were not willing to participate and those who were already diagnosed or treated for heart diseases were excluded from the study. A detailed informed consent was taken from the study subjects before data collection.

A self-administered anonymous structured questionnaire was used to obtain information about family history of CVDs and awareness about CVD risk factors and cardiovascular risk behaviors including diet, physical activity, smoking, and alcohol habits from the study subjects. Data were collected after obtaining ethical approval from the ethical committee of the college.

According to USDA Food Guide Pyramid for adults the minimum recommendation is intake of three servings of vegetables and two servings of fruits per day.[4] One serve of vegetables is half cup of cooked vegetables or one cup of salad vegetables or three-fourth cup of vegetable juice. One serve of fruits is one medium apple, orange, banana; or half cup of chopped, cooked, canned fruit; or three-fourth cup of fruit juice. Frequent consumption of carbonated soft drinks and fast foods is taken as either once or more everyday or 4–6 days in the past week. Regular physical activity is brisk walking for 30 min or exercise in spare time everyday or 4–6 days in a week. Low physical activity is less than 4 days in a week. Sedentary activity is sitting, reading, watching television, playing video games, and using computer continuously for 4 h or more. Current smokers are those who have smoked at least 100 cigarettes in their lifetime and currently smoke cigarettes. Current alcoholics are those who have taken alcohol in the last 30 days and are currently drinking alcohol.

The data entry and analysis were done using SPSS (Statistical Package for the Social Sciences) for Windows, version 17. Unpaired *t*-test and χ^2-test were applied to find out the association between BMI and family history of CVDs.

Results

Age and Sex Distribution of Students

The study subjects were 146 first-year medical students in the 17–22 year age group. There were 77 men and 69 women and a large proportion of them belonged to 18–19 year age group [Figure 1].

Awareness about CVD Risk Factors

There was lack of awareness about CVD risk factors among students. About 3.5% and 4.2% students were not aware that eating high fat and high sugar food were CVD risk factors, respectively; 7.6%, 7.9%, and 11.0% students were not aware that intake of alcohol, smoking, and tobacco chewing were CVD risk factors, respectively; 14.4% students were not aware that a relative with hypertension (HTN) is a CVD risk factor; 14.4% students were not aware that eating fast foods is a CVD risk factor; 21.3% students were not aware that passive smoking is a CVD risk factor; 24.7% students were not aware that eating high-salt-containing foods is a CVD risk factor; 25.4% students were not aware that drinking soft drinks is a CVD risk factor; 27.4% students were not aware that leading a sedentary lifestyle is a CVD risk factor; and 4.7% and 3.5% of students had misconception and falsely reported that doing exercise and eating fruits and vegetables were CVD risk factors, respectively [Table 1].
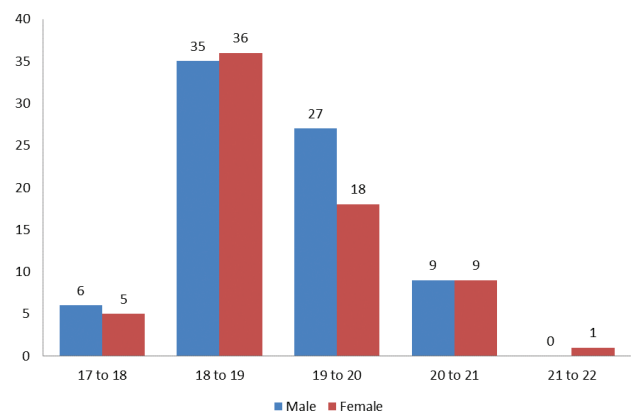

Figure 1: Age and sex distribution of first-year medical students (in numbers)

Table 1: Awareness about CVD risk factors among students (in percentage)

Awareness	Yes (%)	No (%)
High fat food	96.5	3.5
High sugar food	95.8	4.2
Alcohol	92.4	7.6
Smoking	92.1	7.9
Tobacco chewing	89.0	11.0
Relatives HTN	85.6	14.4
Fast foods	85.6	14.4
Passive smoking	78.7	21.3
High-salt food	75.3	24.7
Soft drinks	74.6	25.4
Sedentary lifestyle	72.6	27.4

Note: 4.7% and 3.5% of students had misconception and falsely reported that doing exercise and eating fruits and vegetables were CVD risk factors, respectively.

CVD Risk Behavior among Students

Diet-Related Risk Behavior. The minimum recommendation according to the USDA Food Guide Pyramid of consumption of three or more servings of vegetables and two or more servings of fruits per day was not reported by 50.7% and 54.1% students, respectively. Frequent intake of carbonated soft drinks and fast foods was reported by 16.5% and 24.7% students, respectively. Frequently high salt intake by adding extra salt or by eating items such as papad, sauces, and pickles was reported by 31.4% [Figure 2].

Physical and Sedentary Activity. Large proportion of students (54.8%) were involved in low physical activity. Spending continuously more than 4 h on a typical day in sedentary activities during their leisure time (sitting, reading, watching television, playing video games, and using computer) was noted among 66.4% students [Figure 2].

Smoking and Alcohol Use. Current alcohol users and current smokers were 10.3% and 8.9% students, respectively [Figure 2].
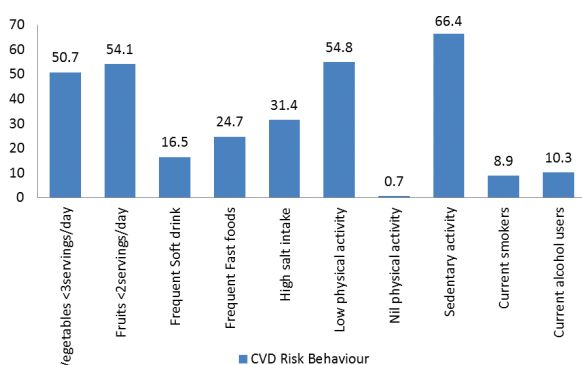

Figure 2: CVD risk behavior among students (in percentage)

Classification of Students' BMI

Out of total students, 13.7% were underweight (BMI < 18.5 kg/m^2), 21.3% were overweight (BMI > 25 kg/m^2), and remaining 65% were normal [Figure 3].

Out of all male students, 14.3% were underweight, 26% were overweight, and remaining 59.7% were normal [Figure 4].

Out of all female students, 13% were underweight, 16% were overweight, and remaining 71% were normal [Figure 5].

Mean BMI of Students with and without Family History of CVDs

Students with a family history of CVDs had a higher mean BMI (22.61 vs 21.44 kg/m^2) than those without a family history of CVDs, and it was statistically significant ($P < 0.05$) [Table 2].
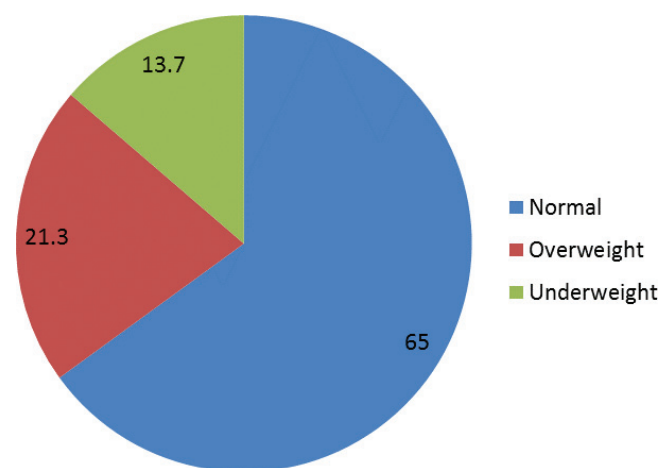

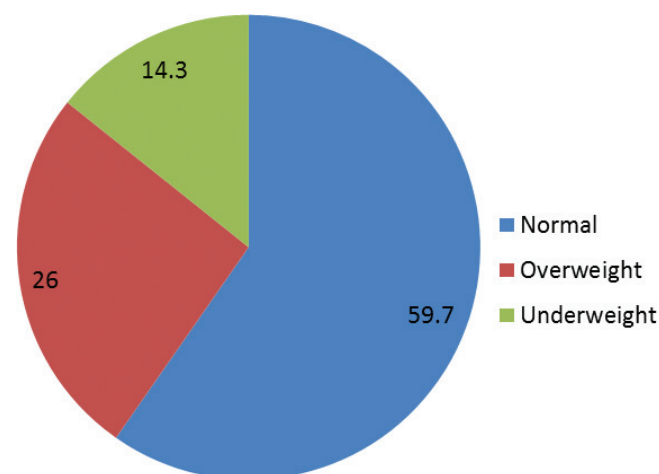**Figure 3:** Classification of BMI among total students

Figure 4: Classification of BMI among male students
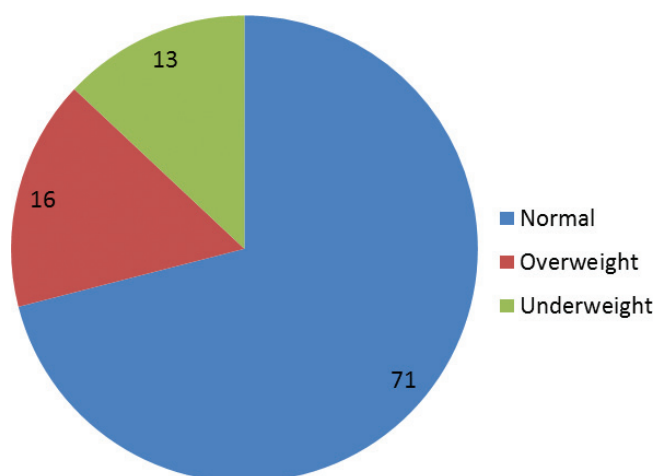
Figure 5: Classification of BMI among female students

Table 2: Mean BMI of students with and without family history of CVDs

BMI	With amily history (*N* = 94)	Without family history (*N* = 52)	*t*-Test value	*P*-value
Mean BMI of students	22.7957	21.4410	2.0510	0.0421*
Standard deviation	4.0379	3.3934		
Standard error of mean	0.4165	0.4706		

*Significant at 5% level.

Association between Overweight Students and Family History of CVDs

The association between overweight students and family history of CVDs was statistically significant (*P* < 0.05) [Table 3].

Table 3: Association between overweight students and family history of CVD

Variable	Family history (N = 94)	No family history (N = 52)	Total (N = 146)	χ2-Value	P-value
Overweight students	25 (26.6)	6 (11.5)	31 (21.2)	4.539	0.0331*
Normal weight students	69 (73.4)	46 (88.5)	115 (78.8)		

*Significant at 5% level.
Numbers within parentheses are in percentage.

Discussion

In this study, consumption of three or more servings of vegetables and two or more servings of fruits per day was not reported by 50.7% and 54.1% students, respectively. Frequent intake of carbonated soft drinks and fast foods was reported by 16.5% and 24.7% students, respectively. Frequently high salt intake was reported by 31.4% students. In a study by Rustagi *et al.*,[5] consumption of carbonated soft drinks either once or more on daily basis was present in 23.7% students and 32.0% reported frequent consumption of fast foods in past week.[5] Poor food habits and excess salt intake by medical students was also reported by Skemiene *et al.*[6] This is a matter of concern as in spite of staying in the medical college and gaining health-related knowledge, the cardiovascular risk behavior among students did not reduce.

In this study, large proportion of students (54.8%) were involved in low physical activity. Spending continuously more than 4 h on a typical day in sedentary activities was noted among 66.4% students. In a study by Rustagi *et al.*,[5] large proportion of students were either not carrying out or were involved in only occasional physical activity in past week. Low physical activity and long hours of sedentary work was also reported in other studies carried out among university students (22%–62%).[7,8] Breaks during continued sedentary activity (i.e., standing up, walking down the hall, and others), regardless of physical activity level or energy expenditure of breaks have been reported to reduce a number of individual CVD risk factors such as high blood pressure and high cholesterol.[9,10] The importance of performing light activities (e.g., walking or standing) in between long sedentary hours must be emphasized among medical students.

In this study, current alcohol users and current smokers were 10.3% and 8.9% students, respectively. In a study by Rustagi *et al.*,[5] consumption of alcohol was present in 28.8% students but only small proportion of students (7%) were current tobacco users. Smoking was reportedly increased among medical students between the year of entry and the final year in some studies.[11,12]

In this study, 13.7% students were underweight (BMI < 18.5 kg/m^2) and 21.3% students were overweight (BMI > 25 kg/m^2). Male students had a higher prevalence of overweight (26% vs 16%) than female students. Students with a family history of CVDs had a higher mean BMI (22.61 vs 21.44 kg/m^2) than those without a family history of CVDs and it was statistically significant (*P* < 0.05). The association between overweight and family history of CVDs among students was statistically significant (*P* < 0.05). In a study by Bao *et al.*,[13] offspring with parental heart attack history were significantly overweight after 10 years of age and showed elevated levels of total cholesterol, very-low-density lipoprotein (VLDL) cholesterol, low-density lipoprotein (LDL) cholesterol, insulin, and glucose after 17 years of age, irrespective of weight. Offspring of parents with diabetes were significantly overweight, irrespective of age. Offspring of parents with HTN displayed overweight regardless of age, higher levels of blood pressure

after age 10 years, and elevated levels of triglycerides and VLDL cholesterol after age 24 years irrespective of weight.[13] In another study by Bertsias *et al.*,[14] approximately 40% men and 23% women had BMI $\geq$ 25.0 kg/m². Subjects above the obesity indices cutoffs had significantly higher values of CVD risk factor variables. BMI was the strongest predictor of HTN.[14] In another study by Grotto *et al.*,[15] offspring of a parent with a positive CHD history had a higher mean BMI (23.22 vs 22.86 kg/m², $P < 0.001$) and were more likely to be obese (5.4 vs 3.7%, $P < 0.001$) than those of parents with no history of CHD.[15]

Limitations of the Study

Other forms of tobacco consumption were not included in the study. Risk factors such as stress due to studies, waist-to-hip ratio, blood pressure, and blood cholesterol levels among students were not considered in this study. Because the subjects of this study were only first-year medical students, the percentage of CVD risk behaviors was not higher and it is expected to increase in the due years of their medical course. Follow-up studies need to be conducted among the same subjects to study the variation in their CVD risk behaviors and all the above limitations need to be addressed.

Conclusions

Lack of awareness about CVD risk factors and unhealthy behavioral practices are prevalent among first-year medical students and may progress as students advance through medical college. The practices of future physicians are determined by the perceptions and behavior they acquire today. Early intervention in medical students has a positive effect on their health behavior. Higher emphasis must be given on overweight and obese students with parental history of CVDs. Behavior change communication and health education strategies are essential to target these risk behaviors by encouraging all the future doctors to adopt healthy lifestyle. This will ensure that students will become good prevention oriented physicians. Our study encourages the need of similar studies across the health institutions of the country to generate a knowledge base regarding CVDs and to formulate a national health education strategy accordingly.

Acknowledgment

References

1. World Health Organization. Preventing Chronic Diseases: A Vital Investment. Geneva: WHO 2005.
2. World Health Organization. Noncommunicable Diseases Country Profiles. Geneva: WHO 2011.
3. India's No. 1 Killer: Heart Disease. *IndiaToday*. Available at: http://indiatoday.intoday.in/story/India's + no.1 + killer: + Heart + - disease/1/92422.html (last accessed May 23, 2014).India's No. 1 Killer: Heart Disease. *IndiaToday*. Available at: http://indiatoday. intoday.in/story/India's + no.1 + killer: + Heart + disease/1/92422. html (last accessed May 23, 2014).
4. USDA. The Food Guide Pyramid. Available at:http://www.cnpp. usda.gov/Publications/MyPyramid/OriginalFoodGuidePyramids/ FGP/FGPPamphlet.pdf (last accessed June 2, 2014).
5. Rustagi N, Taneja D, Mishra P, Ingle G. Cardiovascular risk behaviour among students of a medical college in Delhi. Indian J Community Med 2011;36(1):51–3.
6. Skemiene L, Ustinaviciene R, Piesine L, Radisauskas R. Peculiarities of medical students' nutrition. Medicina (Kaunas) 2007;43:145–52.
7. Brandão MP, Pimentel FL, Silva CC, Cardoso MF. Risk factors for cardiovascular disease in a Portuguese university population. Rev Port Cardiol 2008;27:7–25.
8. Irwin JD. The prevalence of physical activity maintenance in a sample of university students: A longitudinal study. J Am Coll Health 2007;56:37–41.
9. Hu FB, Li TY, Colditz GA, Willett WC, Manson JE. Television watching and other sedentary behaviours in relation to risk of obesity and type 2 diabetes mellitus in women. JAMA 2003; 289:1785–91.
10. Healy GN, Dunstan DW, Salmon J, Cerin E, Shaw JE, Zimmet PZ, et al. Breaks in sedentary time: Beneficial associations with metabolic risk. Diabetes Care 2008;31:661–6.
11. Ramakrishna GS, Sankara Sarma P, Thankappan KR. Tobacco use among medical students in Orissa. Natl Med J India 2005;18:285–9.
12. Singh SK, Narang RK, Chandra S, Chaturvedi PK, Dubey AL. Smoking habits of the medical students. Indian J Chest Dis Allied Sci 1989;31:99–103.
13. Bao W, Srinivasan SR, Wattigney WA, Berenson GS. The relation of parental cardiovascular disease to risk factors in children and young adults. The Bogalusa Heart Study. Circulation 1995;91:365–371.
14. Bertsias G, Mammas I, Linardakis M, Kafatos A. Relation of parental history of coronary heart disease to obesity in young adults. BMC Public Health 2003;3:3.
15. Grotto I, Huerta M, Kark JD, Shpilberg O, Meyerovitch J. Relation of parental history of coronary heart disease to obesity in young adults. Int J Obes Relat Metab Disord 2003;27:362–8.