Original Article

The Alarming Prevalence of Cardiovascular Risk Factors among the Undergraduate Medical Students in Bangladesh

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Abstract

Background: Cardiovascular disease (CVD) is a major emerging health problem. In Bangladesh, 27% of death occur due to CVD. Limited physical activity and dietary changes are the most common cause for higher incidence of CVD in developing countries. In addition, overweight and obesity also contributes to their cause. For this reason, the prevalence of CVD risk factors need to be assessed urgently among young adults.

Objective: To assess the prevalence of risk factors of cardiovascular disease in undergraduate medical students.

Materials and Methods: A cross sectional study, among 4th year medical students was done in the Department of Pharmacology and Therapeutics, at Khwaja Yunus Ali Medical College (KYAMC) from September 2022 to November 2022. Altogether 90 medical students (40 male & 50 female) of 4th year participated in this study. To collect data, a questionnaire containing sociodemographic criteria was provided to them. In addition, physical parameter like systolic blood pressure, diastolic blood pressure, height, weight and waist circumference also were recorded. From these results Body Mass Index and waist-height ratio were calculated.

Results: Our result showed that 25% of male and 36% of female medical students were overweight. Moreover, obesity was more among male medical students (12.5%) than female(2%). Additionally, 62.5% male and 78% female medical students were physically inactive.

Conclusion: Life style choices, eating habit and physical inactivities in early adulthood increases the risk of cardiovascular disease. The present study revealed the higher proportion of female students being overweight, physically inactive and and having familial predisposition are prone to developing CVD.

Key words: Risk factors, Cardiovascular disease, Medical students, Bangladesh.

Introduction

Cardiovascular disease (CVD) is one of the most emerging health issues and it is the leading cause of premature death throughout the world. Unfortunately the middle-income and low-income countries are disproportionately affected. In 2012, 17.5 million deaths (31% of all death around the world) were caused by CVDs and about 80% of that death occured due to CVD in Low and Middle-Income countries.[1] Global disability from CVDs increased about 85%.[2] Disability-adjusted life years lost in Bangladesh is about 13.4% due to CVDs and associated with its risk factors.[3] According to Prasad et. al (2011), south

Asians are a more vulnerable racial group those having a high prevalence of coronary heart disease compared with other ethnicities.[4] Due to rapid social, demographic, and economic transition, China and India are carrying a huge burden of CVD. In Bangladesh, 27% of deaths occur in CVD because of all causes, whereas 52% of all deaths occur due to non-communicable diseases.[5]

Due to rapid urbanization, limited physical activity and dietary changes higher incidence of CVD occurs mostly in developing countries. According to the INTERHEART study, Bangladesh

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has the highest risk factors for the prevalence of CVD among South Asian countries. In Bangladesh, 99.6% males and 97.9% females are exposed to at least one of the established risk factors of CVD. In Bangladesh, among general population, the level of awareness about the risk factors of CVD is very low, due to low literacy rate and lack of access to healthcare, and the detection and control rate of CVD risk factors.[6]

Overweight and obesity affect both developed and developing countries. Obesity and some morbidities associated with it are the leading cause of cardiovascular disease (CVD), along with certain types of cancer, types-2 diabetes, and some other health problems.[7]

Profiles of risk factors in young adulthood (age between 18-24 years) strongly predict long-term risk of CHD. Understanding the magnitude and the types of risk factors of CVD among young adults is an important aspect to establish intervention targeted intervention, which achievable by promoting lifestyle changes before disease progression occurs.[8] Despite growing evidence, risk assessment and efforts of disease prevention are lacking in this age group. Most of the young adults who are not screened are unaware of their CHD risk. Despite its high prevalence, those young adults are underestimated in the risk profile.[9]

In 2013, The American Heart Association recommended that screenings where must include assessment of all CHD risk factors, for example, lifestyle habits (exercise, diet, and smoking), glucose, blood pressure, and also Body Mass Index in addition to the traditional lipid panel.[10]

Among young adults, the prevalence of CHD risk factors needs to be urgently addressed. There are no studies in Bangladesh that are conducted for the assessment of CVD risk factors among medical students. As a result, such studies are needed urgently.

The objective of the current study is to assess of risk factors of cardiovascular disease in undergraduate medical students.

Materials and Methods

This study was a cross-sectional study among 4th year medical students. This study was carried out by the Department of Pharmacology and Therapeutics of Khwaja Yunus Ali Medical College and Hospital (KYAMC), Enayetpur, Sirajgonj from September – November, 2022. Prior conducting the study, adequate counseling regarding importance of the study was done as well as informed consent from the participants was obtained.

Among all 4th year medical students total 90 students participated in this study. Among them 40 students were male and 50 students were female. At first a questionnaire form was provided to the participants to fill up. The form contained sociodemographic criteria like age, gender, family history of hypertension, diabetes mellitus, daily food habit (intake of fruits and vegetables), pattern of daily physical activites etc. The measurement of physical parameters like systolic blood pressure (SBP), diastolic blood pressure (DBP), height, weight and waist circumference was recorded following standard procedures. From these measurements Body Mass Index (BMI) and Waist-height ratio were calculated. Instruments used for these measurements were Sphygmomanometer, Stethoscope, Height-weight machine and Measuring tape. Data analysis was done by using SPSS software package Version 20.0. The quantitative variables were expressed as the Mean ± Standard Deviation.

Results

Table- I: Physical parameters among male (n= 40) and female(n= 50) students

Physical Parameters	Male (n=40)			Female (n=50)		
	Mean	SD	Mean ± SD	Mean	SD	Mean ± SD
Age	22.45	092	22.45 ± 0.92	22.3	0.9	22.3 ± 0.9
Systolic BP	119.4	7.78	119.4 ± 7.78	112.5	9.04	112.5 ± 9.04
Diastolic BP	80.4	7.15	80.4 ± 7.15	73.34	5.80	73.34 ± 5.80
Height	172.37	6.77	172.37 ± 6.77	158.46	5.7	158.46 ± 5.7
Weight	72.1	13.57	72.1 ± 13.57	58.42	9.77	58.42 ± 9.77

Table- II: Obesity index among male and female students

Obesity index	Male (n=40)			Female (n=50)		
	Mean	SD	Mean ± SD	Mean	SD	Mean ± SD
BMI	24.25	3.95	13.57 ± 3.95	23.22	3.1	23.22 ± 3.1
Waist circumference	88.02	8.74	88.02 ± 8.74	81.38	8.7	81.38 ± 8.7
Waist height ratio	.50	.06	.50 ± 0.06	.51	0.05	.51 ± 0.05

Table III shows waist circumference (>90 cm) was 40% in male and waist circumference (>80 cm) was 56% in female medical students.

Table III: Waist circumference between male and female students

	Male (>90 cm n =16)	**Female** (>80 cm n= 28)
Waist circumference	40%	56%

Fig- 1, shows 40% male and 52% female medical students had family history of hypertension. Moreover family history of IHD was found in 7.5% male compared to 10% female medical students. Whereas female medical students had more family history of diabetis mellitus (54%) than male students (47.5%). On the other hand, family history of prehypertensive was found in 20% male and 10% female medical students.

Fig-1: Family history of HTN, IHD, DM and prehypertension among male and female students
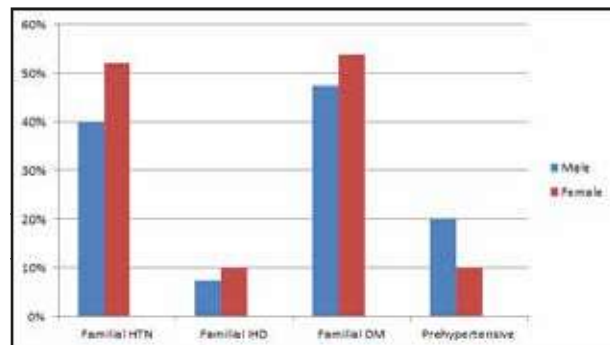

Fig – 2, shows only 37.5% male in comparison which 22% female medical students were physically active. In addition, male medical students consumed more fresh vegetables (45%) and fresh fruits (62.5%) than their female counterparts which is 30% for both criteria respectively. Furthermore, male students consume more meat (85%) compared to female students (52%). Similar trend continues in terms of consumption of sweets, where the data shows 50% of male and 40% of female took sweets with their daily meals.

Fig- 2: Daily physical activity and food habit among male and female medical students
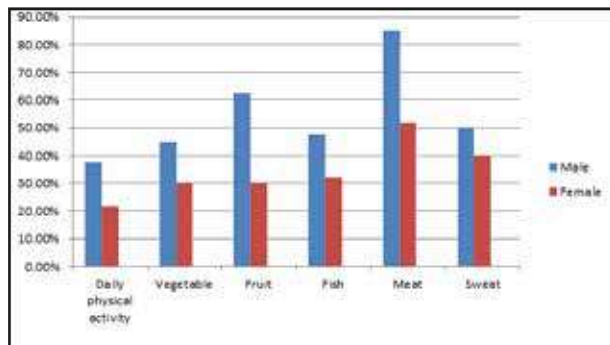

Table IV shows almost similar BMI (18.5) or below was found in 2.5% male and 2% female medical students. However 25% male compared to 36% female medical students were overweight. On the contrary, significant number of male (12.5%) compared to female (2%) medical students were obese.

Table IV: Body Mass Index (BMI) between male and female medical students

Body mass index (BMI)	Number of male (40)	Percentage (%)	Number of female (50)	Percentage (%)
Below (18.5)	1	2.5%	1	2%
Normal (18.5-24.9)	24	60%	30	60%
Overweight (25–29.9)	10	25%	18	36%
Obese (more than 30)	5	12.5%	1	2%

Fig–3: Different percentage of BMI among male medical students
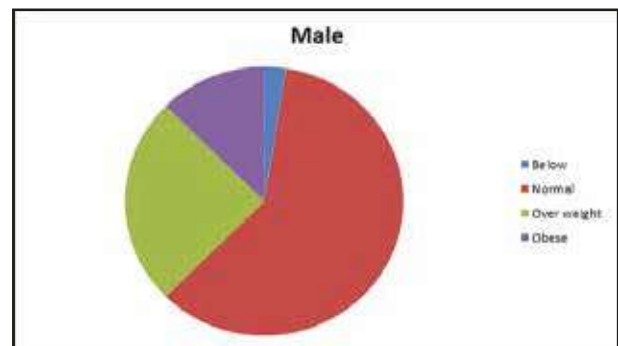
Fig-4: Pie chart showing different percentage of BMI among female medical students
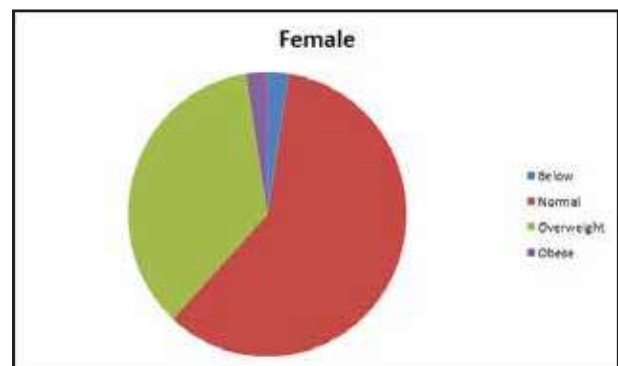
Discussion

The epidemic of cardiovascular diseases is fast reaching in the developing world. The studies showed that the Indian population is more prone to develop cardiovascular diseases (CVD).[11] CVD develops at a younger age and have a lower cutoff value for obesity/overweight.[12] The study was done to assess the cardiovascular risk factors in undergraduate medical students.

Our result showed 25% of the male compared to 36% of female medical students were overweight (25≤ BMI< 30) kg/m2. A study in Slovakia showed that 16% of male but only 2% of female medical students had a BMI over 25 kg/m².[13] Another study in United States detected around 20% of the medical students had BMI>24.7 kg/m².[14] Similar survey of Louisiana state university showed significant higher percentage (37%) of males in contrast to only 9% of females were overweight.[15] The result of Ibrahim, et al. from Soudi Arabia showed the prevalence of overweight among female was 26.8%.[8] Very near similar prevalence (29.1%) was found among females from Dammam university KSA.[16] In comparison to the above mentioned studies it was found in our study that the proportion of overweight medical students (36%) at present is highly alarming especially among the female medical students.

The present study also revealed that obesity among male medical students was 12.5% and in female medical students was only 2%. The same study among university of Crete medical students, Greece revealed the prevalence of obesity in medical students is 4.3%.[7] Another study in Saudi Arabia revealed the prevalence of obesity by 12.7% among medical students.[8] Similarly, in the present study, the prevalence of obesity among the male medical students is higher than the females ones.

The present study showed the percentage of male medical students performing daily physical activity (37.5%) is more than female students (22%). A similar study in KSA found the percentage of medical students performing daily physical activity is 42.1%.[8] Another study among South Indian medical students showed that 62.1% of female medical students had no exercise and 75.9% had no sports.[17] The higher level of physical inactivity among the females could be one of the reasons for higher percentage of overweight among the female medical students.

In our study, systolic blood pressure among male medical students was found (mean± SD = 119.4 ± 7.78) mm Hg among the female medical students was (mean ± SD = 112.5 ± 9.04) mm Hg. The Diastolic blood pressure was found in male (80.4 ± 7.15) mm Hg and in female (73.34 ± 5.80) mm Hg. The prevalence of prehypertensive among the male students was 20% compared to the female students, which was 10%. The prevalence of prehypertension or hypertension among South Indian medical students was 37.5% (male) and 18.6% (female).[17] Another study in Tamil Naru detected hypertension among 6% of medical students.[18]

These findings are alarming because of the possibility of developing hypertension in their adult life.

Dietary habit is one of the modifiable risk factor for CVD. Daily intake of fresh vegetables and fresh fruits is helpful to avoid such condition. The present study found only 45% of male in contrast to 30% of female medical students consume fresh vegetables. Additionally, a higher percentage of males (62.5%) took fresh fruits compared to females (30%). The study on South Indian medical students found 15.9% of medical students consumed adequate quantity of fruits and vegetables everyday.[17] Another study by Rustagi, et al in Delhi detected only 12% of the medical students complied with the recommended quantity of fruits and vegetables intake per day.[19]

The reports indicate the lack of consciousness for developing dietary habit among the medical students in the Indian subcontinent.

At the present study found positive family history for hypertension in 40% of male compared to 52% of female students. It also found positive family history of Diabetis mellitus 47.5% in male contrary to 54% in female. The family history of positive ischaemic heart disease was 7.5% male in contrast to 10% female medical students. Paul, et al found family history of cardiovascular diseases in 59% male in comparison to 68.4% female.[17]

The finding reflects the higher proportion of female students having positive history of familial cardiovascular diseases and metabolic syndromes.

According to Snehalatha et al (2003), waist circumference (WC) is an important index of body adiposity.[20] Waist circumference > 90cm in male and > 80 cm in female is a sign of insulin resistance leading to metabolic syndromes and CVD. Our present study revealed WC in male (mean ± SD = 88.02 ± 8.74) cm and in female (mean ± SD = 81.38 ± 8.7) cm. The prevalence of higher WC (> 90 cm) in male was found 40% and in female (> 80%) was found 56%. A similar study on WC detected higher WC in 18% male and 38% female medical students.[18] Another study by Kurian S, et al also revealed higher WC as a risk factor in female students in comparison to males (P value 0.005 in female and 0.02 in male).[21]

The present study revealed the higher proportion of female students being overweight, physically inactive and more familial predisposition for developing CVD.

Recommendation

1. A particular time should be included in medical curriculam to develop principles of healthy eating and lifestyle modification.
2. Performing physical activity throughout the year will help to improve physical fitness of medical students.
3. Structured educational programs will help to change lifestyle choices to prevent the development of cardiovascular disease.
4. The medical colleges should have relaxed environment for students through sports, extra curricular activities and greater interaction between teacher-student interaction.
5. Healthy food should be provided in the medical college canteens and fast food must be discouraged.
6. Structured assessment systems would reduce psychological stress among the medical students.

Conclusion

The medical students are future role models of community educators. The participants are in early their adulthood, where it is easier for formation of behavior, attitude and habit that maintain throughout of life. In conclusion, including recommended healthy dietary intake and physical activities will reduce cardiovascular risk factors in medical students or young adults.

Acknowledgment

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