

Gender based differences in dietary habits and nutritional status of undergraduate students of a medical college in West Bengal

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Abstract

Introduction

Gender differences in anthropometric indices, physical activity, and dietary habits among medical college students at the West Bengal University of Health Sciences has also not been addressed. The present study was conducted to answer these questions.

Materials and methods

A descriptive analytical study with cross sectional design was conducted among undergraduate students residing at the boys and girls' hostels of MJNMCH, Koch Behar. The students were interviewed using a pre-designed, pretested schedule, anthropometric measurements made using a stadiometer, weighing scale and measuring tape, done in a convenient time after obtaining informed consent from respondents. Nutritional assessment was based on dietary habits (eating practices), that included number of meals eaten in a day, where meals were eaten, snacking habits, meal skipping habits and daily food types and fluids consumption. Anonymity and confidentiality was ensured. Collected data were entered into Microsoft Excel, cleaned and analysed using the IBM SPSS (version 21) software.

Results

A total of 129 students, (46.5% male and 53.5% female), with a mean age of 20.9 ± 1.5 years, participated in this study. There was no significant difference in the mean BMI between the male and female participants. The hip and waist circumference and the waist: hip ratio was higher in males than in females. More male students engaged in exercise, compared to female students (95% vs. 47.1%, $p < 0.001$). Only 24.6% of male students and 20.4% of female students engaged in physical activity with duration >150 minutes ($p=0.597$). A higher proportion of students in both the groups engaged in walking/ jogging or dancing as the form of exercise compared to cycling or outdoor games. None of the female students in the present study smoked, while smoking was reported in 75% of the male students ($p=0.000$).

Distribution of vegetarians and non-vegetarians in both males and female groups were similar. Male students were more likely to have higher number of meals per day than female students. A significantly higher proportion of female students (47.8%) rarely or never drank carbonated drinks compared to males (26.7%).

Conclusion

The undergraduate MBBS students had inadequate diet as there was no regular messing facility. The lack of physical activity in a large proportion of students, especially females, despite availability in the present setting calls for a more detailed investigation to find the reasons for the same.

Key words: eating practices, MBBS students, gender differentials

Introduction

Nutritional status could be seen as the combination of an individual's health which is influenced by intake and utilization of nutrients and determined from information obtained by physical, biochemical and dietary studies.¹ Eating habits include the reasons why individuals eat, the foods they consume, who they eat with, where they get their food from, how they prepare it, how they utilise it, and how they dispose of it. The states of undernutrition and overnutrition can be used to define poor nutritional status. Students who lead unhealthy lifestyles and engage in little physical activity while in college are more likely to have health problems later on.²

The urbanization-related nutrition transition, which is characterised by an increase in energy, saturated fats, choles-

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terol, added sugar, and sodium intake, and a decrease in fibre, vegetables, fruit, and legume intake, is thought to be a contributing factor to the rising incidence of NCDs in developing countries. Also linked to the change are rising rates of obesity, inactivity, cigarette use, and excessive alcohol intake.³

The cycle of dietary habits and nutritional status is significantly influenced by gender in addition to other factors. Dietary needs for males and women are different. For instance, the ICMR suggests that males consume more protein (43 g/day) than women (36.3 g/day), and that women of reproductive age consume more iron (15 mg/day) than men (11 mg/day).⁴ Furthermore, gender-specific eating attitudes and practises have an impact on the pattern of food consumption. Women, in general, lean towards better food options than men do, and they are more concerned with maintaining healthy eating habits to preserve their physical fitness.⁵

During the academic years, students experiment increased freedom of choice about their food choices, health-related behaviours, practising sports, and developing their own lifestyle. They gradually change their behaviour as a result of moving into a new home with hectic schedules, tempting unhealthy food options, and the risk of skipping meals. Eating habits formed in adolescence and early adulthood have a significant impact on behaviour over the long term and on adult life.⁶

Medical students are a unique group since it is generally believed by the general public that they are more knowledgeable than non-medical students regarding proper eating practises and healthy lifestyles. This is essential because the students are the future doctors, and those who live a healthy lifestyle themselves are likely to have a favourable impact on their patients.⁷ Yet, research has shown that students studying medicine and paramedicine, in particular, who reside in hostels far from their homes, are more prone to abnormal eating patterns, inactivity, and addiction. Overweight is more common among medical students. In India, medical and nursing students participated in a number of studies where the prevalence of overweight was found to be 11.7%, 11%, 10%, and 17.5% correspondingly.⁸

The dietary habits of medical college students in West Bengal have not yet been thoroughly studied, and the issue of gender differences in anthropometric indices, physical activity, and dietary habits among medical college students at the West Bengal University of Health Sciences has also not been addressed (WBUHS).

Objectives

To compare the gender-based differences in anthropometric measurements, exercise and dietary habits among medical students in a medical college in West Bengal.

Materials and methods

Study type and design: Descriptive analytical study with cross sectional design.

Study period: One month.

Study Setting: Boys and girls hostels of MJNMCH.

Study population: Undergraduate students of MJNMCH.

Exclusion criteria: Those who were not present during the data collection period

Sample size: All the students present in the hostels were included in the study population and hence complete enumeration technique was used

Tools:

- Pre-designed, pretested schedule was used to collect data
- Stadiometer for measuring height
- Weighing scale
- Measuring tape

Technique:

1. Interview by using the schedule
2. Anthropometric measurements
3. Nutritional assessment

Study Variables:

Socio-demographic variables:

Age, Gender, Religion, Type of family, Education, Occupation of parents, per capita income, Addiction etc

Dietary habits (eating practices): eating practices refer to meal patterns. Meal pattern refers to the frequency of major meals eaten in a day, where meals are eaten, snacking habits, meal skipping habits and daily food types and fluids consumption.

Weight: The subject's weight without shoes and while wearing light clothes, was measured to the nearest 0.1 kg, using an electronic scale.

Height: Height was measured to the nearest 0.1 cm using a measuring tape making the subject stand with support in the wall.

BMI referred to the relationship between current weight and current height ($BMI = \text{weight (kg)}/\text{Height (m}^2\text{)}$). The BMI was classified according to the WHO international classification of BMI (Underweight: $BMI < 18.5$, normal weight : $18.5 - 24.9$, Overweight : ≥ 25.0 , Obese: ≥ 30.0).

Waist circumference (WC): WC refers to a measure of the abdominal circumference passing through the umbilicus as viewed from the front in nearest centimeter. Waist circumference (WC) was measured with a flexible but inextensible measuring tape to nearest 0.1cm using the perimeter of the area through the umbilicus at end expiration.

Hip circumference (HC): HC refers to the measurement which is to be taken around the widest portion of the buttocks in nearest centimeter. The measuring tape should snugly fit around the hip.

Waist-hip ratio (WHR): refers to waist circumference (cm) divided by hip circumference (cm). The hip circumference (HC) was measured to the nearest 0.1 cm, using a flexible but inextensible measuring tape by using the perimeter of the point of greatest circumference around the hips and the WC as described above.

Data collection:

Data was collected using a pre-tested schedule consisting of two parts:

- The first part includes the socio-demographic variables of the students, like age, sex, religion, caste, staying place, per capita income of parents etc.
- The second part includes anthropometric measurements.
- The third part includes questions regarding health-related activities and addictions
- The final (fourth) part consists of questions to assess dietary patterns of students

Data collection technique:

After receiving the permission of the ethics committee, the data collection was initiated. It was done by hostel visit. Structured interviews were done in a convenient time after obtaining informed consent from respondents. Anonymity and confidentiality was ensured. Data collection was done by using the pre tested schedule. After receiving the permission of the ethics committee, the data collection was initiated. It was done by hostel visit. Structured interviews were done in a convenient time after obtaining informed consent from respondents. Anonymity and confidentiality was ensured.

Data analysis:

After collecting the data, it was entered in Microsoft excel datasheet 2007. Data analysis was done using the IBM SPSS, version 21 software. The mean between the groups were compared using Student's t-tests. Results were expressed as means \pm standard deviations (SD). Chi-square analyses were conducted to compare proportions, Results were expressed as total number (n) and proportions(%). All reported p-values were two-sided tests and were compared to a significance level of 5%; differences were considered statistically significant at $p < 0.05$.

Table 1: Sociodemographic characteristics of the study population (n=129)

Variable	Level	Total N (%)
Age in years	18-20	51 (39.5)
	21-23	67 (51.9)
	>24	11 (8.6)
Gender	Male	60 (46.5)
	Female	69 (53.5)
Religion	Hindu	96 (74.4)
	Islam	31 (24.8)
	Others	2 (1.6)
Family	Nuclear	113 (87.6)
	Joint	16 (12.4)
Educational status	Madhyamik or equivalent	10 (7.8)
	Higher Secondary	15 (11.6)
	Graduate	56 (43.4)
	Postgraduate	43 (33.3)
	Illiterate	5 (3.9)
Occupation	Service	69 (53.5)
	Business	30 (23.2)
	Doctor	5 (3.9)
	Farmer	13 (10.1)
	Others	12 (9.3)
PCI	Less than Rs.5000	10 (7.8)
	Rs. 5000-10000	28 (21.7)
	Rs. 10000-20000	39 (30.2)
	More than Rs.20000	52 (40.3)

Results

The socio-demographic characteristics of the study population are shown in **Table 1**. A total of 129 students, (46.5% male and 53.5% female), with a mean age of 20.9 ± 1.5 years, participated in this study. Most students were in the 21–23-year age group followed by 19–20-year age group.

Table 2 shows the anthropometric measurements of the study population based on gender. Although the mean height and mean weight of the male students were significantly higher than the female students, there was no significant difference in the mean BMI between the two groups. The hip and waist circumference and the waist: hip ratio was higher in males than in females although only the difference in waist circumferences between the genders reached statistically significant proportions.

Table 3 shows that a greater proportion of male students engage in exercise compared to female students (95% vs. 47.1%, $p < 0.001$). Regarding duration of exercise and frequency, only 24.6% of male students and 20.4% of female students engaged in physical activity with duration ≥ 150 minutes, the difference between the groups not being statistically significant ($p=0.597$). A statistically higher proportion of students in both the groups engaged in walking/ jogging

Table 2: Comparison of anthropometric characteristics between the genders (n=129)

Characteristics	Total Mean (SD)	Male Mean (SD)	Female Mean (SD)	Independent sample t test	p value	
Weight (kg)	61.1 (12.7)	67 (14.4)	56 (8.1)	5.4320.	000*	
Height (mts)	1.62 (0.11)	1.70 (0.1)	1.55 (0.1)	10.606	0.000*	
BMI (kg/m ²)	23.1 (4)	23.2 (4.7)	23 (3.2)	0.258	0.797	
WaistCircumfer.(cms)	82.9 (9.1)	84.3 (8.9)	82.2 (9.4)	3.314	0.001*	
HipCircumfer.(cms)	93 (7.8)	93.7 (8.2)	93 (8.1)	-0.949	0.344	
Waist:Hip ratio	0.89 (0.07)	0.92 (0.05)	0.86 (0.08)	5.450	0.000*	
Category	Levels N(%)	TotalN(%)	MaleN(%)	Female N(%)	Chi square	p value
BMI Category	< 18.5 18.5-24.99 ≥25	12 (9.3) 85 (65.9) 32 (24.8)	7(11.7) 35(58.3) 18(30)	5(7.2) 50(72.5) 14(20.3)	2.870	0.238
Waste:Hip Ratio	Within normal Range Abdominal obesity present	90 (69.8) 39 (30.2)	58(96.7) 02(3.3)	32 (46.4) 37(53.6)	38.480	0.000*

*statistically significant

Table 3: Comparison of health related habits between the genders (n=129)

Health related habits	Levels	Total N(%)	Male N(%)	Female N(%)	Chi square	p value
Exercise (n=129)	Yes	111 (86.1)	57 (95)	54 (78.3)	7.490	0.006*
	No	18 (13.9)	3 (5)	15 (21.7)		
Duration of exercise / week (n=111)	≥150 minutes	25 (22.5)	14 (24.6)	11 (20.4)	0.280	0.597
	<150 minutes	86 (77.5)	43 (75.4)	43 (79.6)		
Type of exercise (n=111)	Walking/ jogging/ dancing	82 (73.9)	36 (63.2)	46 (85.2)	7.690	0.021*
	Cycling	14 (12.6)	9 (15.8)	5 (9.3)		
	Outdoor games	15 (13.5)	12 (21.1)	3 (5.6)		
Smoking status (n=129)	Yes	114 (88.4)	45 (75)	0	79.470	0.000*
	No	15(12.6)	15 (25)	60(100)		

*statistically significant

or dancing as the form of exercise compared to cycling or outdoor games. None of the female students in the present study smoked, while smoking was reported in 75% of the male students (p-0.000).

Table 4 shows the dietary habits of the medical students over one week. Distribution of vegetarians and non-vegetarians in both males and female groups were similar. There was a statistically significant difference in the number of meals taken per day between the groups. Male students were more likely to have higher number of meals per day than female students. A significantly higher proportion of female students (47.8%) rarely or never drank carbonated drinks compared to males (26.7%).

Discussion

Overweight and Obesity

To our knowledge, this is the first study to examine gender differences in weight status, dietary habits, and exercise among medical students in West Bengal. This study revealed

Table 4: Dietary assessment of students based on gender (n=129)

In an average week	Levels	Total N=129 N(%)	Male N=60 N(%)	Female N=69 N(%)	Chi square	p value
What type of food do you eat	Non-vegetarian	110 (85.3)	50 (83.3)	60 (87)	0.335	0.562
	Vegetarian	19 (14.7)	10 (16.7)	9 (13)		
How many meals do you take per day	2	32 (24.8)	22 (36.7)	10 (14.5)	20.448	0.000*
	3	80 (62)	25 (41.7)	55 (79.7)		
	≥4	17 (13.2)	13 (21.6)	4 (5.8)		
Do you skip breakfast	Yes	62 (48.1)	37 (61.7)	25 (36.2)	8.317	0.004*
	No	67 (51.9)	23 (38.3)	44 (63.8)		
How many times do you eat non veg items	Daily	65 (50.4)	28 (46.7)	37 (53.6)	0.727	0.948
	3-4 per week	19 (14.7)	9 (15)	10 (14.5)		
	1-2 per week	20 (15.5)	10 (16.7)	10 (14.5)		
	Rarely	6 (4.7)	3 (5)	3 (4.3)		
	Never	19 (14.7)	10 (16.7)	9 (13)		
How many times do you eat green leafy vegetables	Regular	47 (36.4)	16 (26.7)	31 (44.9)	10.482	0.015*
	Sometimes	56 (43.4)	29 (48.3)	27 (39.1)		
	Rarely	20 (15.5)	9 (15)	11 (15.9)		
	Never	6 (4.7)	6 (10)	0		
How many times do you eat dairy products	Regular	27 (20.9)	10 (16.7)	17 (24.6)	4.368	0.224
	Sometimes	68 (52.7)	35 (58.3)	33 (47.8)		
	Rarely	27 (20.9)	10 (16.7)	17 (24.6)		
	Never	7 (5.4)	5 (8.3)	2 (2.9)		
How many times do you eat fruits	Regular	29 (22.5)	11 (18.3)	18 (26.1)	7.033	0.071
	Sometimes	16 (12.4)	4 (6.7)	12 (17.4)		
	Rarely	71 (55)	36 (60)	35 (50.7)		
	Never	13 (10.1)	9 (15)	4 (5.8)		
What is your snacking habit	Regular	58 (45)	25 (41.7)	33 (47.8)	0.991	0.804
	Sometimes	29 (22.5)	13 (21.7)	16 (23.2)		
	Rarely	22 (17.1)	11 (18.3)	11 (15.9)		
	Never	20 (15.5)	11 (18.3)	9 (13)		
How many times do you eat fast food	Often	46 (35.7)	21 (35)	25 (36.2)	1.840	0.399
	Sometimes	81 (62.8)	39 (65)	42 (60.9)		
	Never	2 (1.6)	0	2 (2.9)		
How many times do you take carbonated drinks	Regularly	9 (7)	6 (10)	3 (4.3)	10.431	0.015*
	Sometimes	71 (55)	38 (63.3)	33 (47.8)		
	Rarely	39 (30.2)	10 (16.7)	29 (42)		
	Never	10 (7.8)	6 (10)	4 (5.8)		
Total		129 (100)	60 (100)	69 (100)		

*statistically significant

that almost a quarter (24.8%) of students were overweight or obese, 30% in males and 20.3% in females. Dumpala et al,⁹ conducted a study among 125 MBBS students in Telengana, with a mean age of 20 (±0.75) years, and reported an overall prevalence of obesity/overweight of 45%, slightly higher than the present study. Sonawane et al,¹⁰ reported a prevalence of overweight and obesity were 36.8% and 11.1% among 500 medical students from Maharashtra. Overweight and obesity were more observed in boys (48.8%, 11.6%) than girls (30%, 10.55%). Santi Shree et al,¹¹ conducted a cross-sectional study at a medical college in Andhra Pradesh, among 207 medical students from first and third semesters by simple random selection. The authors observed that 16.91% medical students were having combined obesity (obesity according to BMI and waist circumference). Among them 20% were male, and 15.15% were female students. Prevalence of obesity was 11.32% in medical students in Bangalore, done by Gudegowdai KS et al,¹² in 2018. The findings of study done among medical students by Adhikari et al,¹³ in Kolkata in 2014 which showed the prevalence of overweight and obese to be 18% and 2% which was lower than our study. The study done by Manojan KK et al,¹⁴ in Kerala in 2013 showed the prevalence of overweight and obesity to be 24.57% and 25.71%.

In contrast, a study from Gujarat, among students, 18-23 years old, from 5 general colleges, on the other hand, reported a prevalence of obesity and overweight combined as 17.1%. In males it was 17.7%, while in females it was 16.4%.¹⁵ All values were much lower than those reported in the present study. According to an ICMR-INDIAB study in 2015, prevalence rate of obesity and central obesity varies from 11.8% to 31.3% and 16.9%-36.3% respectively.¹⁶

The present study shows a higher level of overweight and obesity among both the genders compared to a similar age group of students from general colleges. This is surprising to note as medical students are supposed to be more knowledgeable about the health problems associated with overweight and obesity. The role of exercise and dietary factors along with long hours of classroom teaching and assignments requiring prolonged sitting may contribute to the higher levels of overweight and obesity compared to general colleges.

Studies have suggested that female college students are more conscious of body image and place higher importance on appearance when compared to college males, and, thus, they may engage in more dieting practices to maintain lower body weight.¹⁷ A study by Alkazemi,⁵ from Kuwait, supported the fact and revealed a higher use of weight loss supplements among female students.

Dietary habits

Based on the findings in the present study, both male and female students included in the study appear to generally have poor eating behaviors, which are reflected by the relatively high prevalence of overweight and obesity in this population. One third of the female students and two-thirds of the male students skipped breakfast. A study from Kuwait, reported one-third of students from general colleges skipping breakfast.⁵ In the present study, diets of both male and female students, were deficient in green leafy vegetables, dairy products, and fruits. A high proportion in both genders were in the habit of snacking, ate fast food and drank carbonated drinks regularly. These eating behaviours likely reflect students' lifestyles, as most of them were hostel boarders, which can include eating outside of their home environment or not being able to prepare their own meals due to time restraints.⁵

Gender differences were seen in the dietary habits of the study population. Female students were significantly less likely to take ≥ 4 meals per day, skip breakfast and drink carbonated drinks regularly. A significantly higher portion of the female students ate green leafy vegetables regularly compared to their male counterparts. Female students were also more likely to eat dairy products and fruits regularly. However, no differences were found in terms of the number of non-veg servings per day or the number of times fast food was

ordered in a week between males and females. Similar differences in dietary habits between genders has been reported from other studies.⁵

In conclusion, dietary studies of medical students is very important in many aspects. An unhealthy diet and a low level of physical activity during university years predispose students to future health issues. Lifestyle changes, peer pressure, limited finances, and access to food also contribute to erratic eating patterns.

Exercise

The World Health Organisation (WHO) defines physical activity as any bodily movement produced by skeletal muscles that requires energy expenditure. Physical activity refers to all movement including during leisure time, for transport to get to and from places, or as part of a person's work. Both moderate- and vigorous-intensity physical activity improve health.¹⁸

The World Health organization (WHO) recommends at least 150–300 minutes of moderate-intensity aerobic physical activity in adults between the ages of 18 and 64 years.¹⁹ Approximately 15% of students reported not engaging in any physical exercise. Of the others only about a quarter of students exercised adequately as per the WHO recommendations. Moderate physical activity like walking, jogging, dancing or cycling (at less than 10 mph) were more common, while only a small proportion of students engaged in vigorous exercise playing outdoor sports.²⁰

One significant finding of the present study was the difference between male and female students with respect to engagement in physical activity. While only 3 (5%) of the male students did not engage in any form of exercise, almost a quarter (21.8%) of female students were physically inactive. In a cross-sectional study, among 180 undergraduate medical students, in Kerala, Joy et al,²¹ found that among males, only 12.68% were physically inactive while 39.44% out of female students were physically inactive. Similar gender variations on physical activity among young adults, have been reported in literature. Studies quantifying physical activity and sedentary time among South Asian women showed low levels of physical activity compared with South Asian men and with white European comparison populations. The majority of studies indicated that South Asian women did not meet the recommended amounts of physical activity for health benefits.²² A cross-sectional comparative study among 319 Egyptian and 297 Saudi medical students, in 2011, reported that physical inactivity was significantly higher among Saudi than Egyptian medical students (41.1% versus 15.4%, respectively). The authors concluded that because time and access were key barriers to medical student exercise, provision of free playgrounds in the college to practice sports during free times would promote physical activity in students. However, the lack of physical activity in a large proportion of students, especially females, despite availability in the present setting

calls for a more detailed investigation to find the reasons for the same.

Conclusion

The undergraduate MBBS students had inadequate diet as there was no regular messing facility and less access to sports activity and exercise due lack of time. The lack of physical activity in a large proportion of students, especially females, despite availability in the present setting calls for a more detailed investigation to find the reasons for the same.

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