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NUTRITIONAL PROFILE OF MEDICAL STUDENTS OF TRIPURA AND ITS IMPACT ON THEIR HEALTH

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ABSTRACT

Background: Everybody needs a wide range of nutrients to lead a healthy and active life and these are derived through the diet they consume daily. Good nutrition is a basic component of health. The present paper deals with the Nutritional Profile of Medical Students of AGMC, Agartala.

Methods: A total of 200 undergraduate medical students (64% males and 36% females) with mean age 20.76(±SD 1.20) years participated in this study. Participants completed a set of questionnaire and pass multiple 24h diet recall. The energy and selected nutrient contents of the food items of medical students constitute sedentary worker group based on the RDA (2010) for Indians by National Institution of Nutrition, Hyderabad. Data were analyzed using SPSS software (version 21).

Results: The findings depict that maximum number of 1st year (56.0%) and 2nd year (58.0%) students have energy consumption less than RDA while in 3rd and 4th year students, the percentage having energy consumption greater than RDA was on the high side. In total, the energy consumption of forty five percent of students was found to be less than normal as per RDA. Underweight males and females consumed only 73.33% and 68.48% vegetables respectively compared to RDA standards. In the present study group in total, the vegetable intake was found to be 68.32% in males and 65.78% in females as compared to RDA standards.

Conclusions: The nutritional status of the students of this college was not excellent.

Key Words: Nutritional Status, Energy Deficiency, Medical Students, Tripura.

INTRODUCTION

It is well known that diet and nutrition play important role in maintaining health and preventing diseases. A nutrient rich healthy diet enables us to maintain a healthy body and mind[1]. The proper dietary habit along with a satisfactory lifestyle pattern which a person adopts from his childhood and continues through his adult life can help to prevent dietary and lifestyle associated diseases[2, 3]. Thus, nutrition education is one of the important practical aspect of nutritional knowledge, plays an important role in basing public awareness and ultimately the health of society. Now-a-days, young adults like the college students are growing independently. They themselves assume the responsibility for their own eating habit, health attitudes and behaviors. In many cases they are switching over to junk food which do not contain any nutrients that are required for proper functioning other than fat deposition. The transition to adolescence where young people experience increased need to express themselves and experience pressure, significantly influence their food choice[4]. Thus, the logical extension for the students was that if their body weight and the level of their physical activ-

ity is known, we can find their energy balance whether they are consuming energy more or less than required. Here, an attempt has been made to assess the nutritional profile and its impact on the health of the medical students of Agartala Govt. Medical College, Agartala.

MATERIAL AND METHODOLOGY

This cross-sectional epidemiological study was conducted from 28th April to 26th may 2012 on 200 MBBS students to study the nutritional assessment of medical students. Using a stratified random sampling, 50 students were randomly selected from each year as strata. Only those students (male and female) were selected who gave the consent to participate in the study. Data was collected by a team of 18 MBBS students of 6th semesters posted in the department of Community medicine.

Sample size: Taking anticipated population proportion(p) 50% (0.5); Type I error 5% (i.e. confidence level 95%); and Precision required on either side of the proportion (d) 10% (i.e. between 10-20%) (=0.1) the calculated sample is 100 based on following formula.

$$\text{Sample size (n)} = + \frac{Z^2_{1-\alpha/2}\ p\ (1-p)}{d^2} = 100$$

Minimum requirement of sample size for the study is 100 MBBS students from Agartala Govt. Medical College, Agartala. Annual intake in AGMC, Agartala is 100 students and we take the fifty students form each year for our study. Our study target is 200 students for more precise information regarding our objectives and equal distribution for each stratum.

A questionnaire was supplied to the students. Both, verbal and written consents were taken before including a student in the study. The consent was affirmed by signing at the end of the questionnaire. After filling up the questionnaire, students were examined by research group for height, weight, and blood pressure. A general physical examination was also done to find out any underlying disease.

The questionnaire consisted of two different parts, PART – A & PART – B. The part-A have three different types of questions. The first group of questions was meant to calculate the daily calories intake. Students were asked to recall the food items and their amounts consumed in last 24 hours. The food items and their amounts were compared with the standard calorific value chart published by the National Institute of Nutrition. As medical students constitute sedentary worker group, their daily calories intake was compared with the standard intake for this group and inferences were made.

The second group included questions on general food habits of medical students. Students were asked to report the food items they consumed generally and their frequency of consumption in a week. The third group of questions was meant to assess lifestyle of the students. Students were asked whether they did exercise or not and the duration of exercise in a week. This was compared with World Health Organisation guidelines which emphasize on moderate level exercise for at least 150 minutes per week. Students were also asked about other aspects of lifestyle like sleep, outing, computer usage, religious activities and tobacco and alcohol consumption. The part-B was on anthropometric measurements of students examined by the research group for height, weight and blood pressure. Blood pressure was measured in sitting position. Both systolic and diastolic blood pressures were considered. A quick general physical examination was also done and any obvious abnormalities were noted.

RESULTS

Table 1 depicts the socio-demographic statuses of the study group. Out of 200 medical students, 128(64%) were males and 72(36%) were females; 80% of the students were Hindu, followed by 13.5% Christians and 5% Buddhists; 71% of them were from Tripura and the remaining 29% from outside; 84.5% were from nuclear families and the remaining were from joint families. Monthly income of families of 16.5% students was below Rs.10, 000 whereas of only 27.0% families were above Rs.30, 000.

Table 2 reveals the information regarding the dietary habits of the study group. It has been observed from this table that maximum percentage of students were non-vegetarian (91%). Only 13.8% of the 3rd year male students and 18.8% of the 4th year female students were highest among the vegetarians.

The distribution of the medical students in different Body Mass Index (BMI) categories is shown in Table 3.

Table 1: Socio- Demographic Statuses of the Medical Students

Variable	Frequency (n=200) (%)
Age	
18- 19	34 (17.0)
20-21	109 (54.5)
22-24	57 (28.5)
Sex	
Male	128 (64.0)
Female	72 (36.0)
Religion	
Hindu	160 (80.0)
Christian	27 (13.5)
Buddhist	10 (05.0)
Others	3 (01.5)
Caste	
Sc	26 (13.0)
St	69 (34.5)
Obc	30 (15.0)
General	75 (37.5)
Native place	
Tripura state	142 (71.0)
Other north-east states	17 (08.5)
Others indian states	41 (20.5)
Type of family	
Nuclear	169 (84.5)
Joint	31 (15.5)
Monthly income of family	
Rs. 1000-5000	08 (04.0)
Rs. 5000-10000	25 (12.5)
Rs. 10000-20000	53 (26.5)
Rs. 20000-30000	60 (30.0)
>Rs. 30000	54 (27.0)

Table 2: Distribution of medical students according to dietary habit

Sex	Vegetarian	Non vegetarian	Total
1st year			
Male	2 (6.7)	28 (93.3)	30
Female	2 (10.0)	18 (90.0)	20
2nd year			
Male	4 (11.4)	31 (88.6)	35
Female	0 (0.0)	15 (100.0)	15
3rd year			
Male	4 (13.8)	25 (86.2)	29
Female	1 (4.1)	20 (95.2)	21
4th year			
Male	2 (5.9)	32 (94.1)	34
Female	3 (18.8)	13 (81.3)	16
Total	18 (9.0)	182 (91.0)	200

Figures in parenthesis indicate percentage

Highest chronic energy deficiency was seen in 23.3% males of 1st year and in 20.0% females of the 2nd year students. Maximum obesity was seen in the 2nd year males (31.4%), and 20% females of 1st year students. Overall, chronic energy deficiency was found to be more prominent among the 1st year college students. The chronic energy deficiency was higher in females (15.3%) as compared to males (9.4%). While 140 (70.0%) students had normal BMI, Obesity and Chronic energy deficiency (CED) were seen in 37(18.5%) and 23 (11.5%) students respectively.

Table 3: Range of BMI grouping students based on sex and year

Sex	<18.5 (CED)	18.6-25 (Normal)	26-34 (Obesity)	Total
1st year				
Male	7 (23.3)	20 (66.7)	3 (10.0)	30
Female	3 (15.0)	12 (60.0)	5 (25.0)	20
2nd year				
Male	1 (2.9)	23 (65.7)	11 (31.4)	35
Female	3 (20.0)	10 (66.7)	2 (13.3)	15
3rd year				
Male	3 (10.3)	19 (65.5)	7 (24.1)	29
Female	2 (9.5)	17 (81.0)	2 (9.5)	21
4th year				
Male	1 (2.9)	27 (79.4)	6 (17.6)	34
Female	3 (18.8)	12 (75.0)	1 (6.3)	16
Total	23 (11.5)	140 (70.0)	37 (18.5)	200

Figures in parenthesis indicate percentage; *Chronic energy deficiency

Table 4 shows the energy consumption and distribution of medical students according to RDA 2010. It is found that maximum number of students of the 1st year and the 2nd year were having energy consumption less than RDA while in 3rd and 4th years, the percentage of students having energy consumption greater than RDA was on the high side. The energy consumption of 60% of male students of the 1st year and 51.4% students of the 2nd year was less than normal as per RDA. Female students (73.3%) of 2nd year have energy consumption less than normal which was also the lowest among all.

In the present study, as against the figure of 2400 kcal of energy for sedentary adult males and 1920 kcal for sedentary adult females (like medical students), the energy consumption was found to be highest (3335.02± 1452.05) among the 3rd year male and lowest (1647.67±952.00) among the second year female students.

Thus, more female students of 2nd year (73.33%) as compared to their male counterparts (51.4%) consumed inadequate calories, less than RDA.

As a whole the 1st year male and 2nd year female students have their calorie consumption less than RDA. For other students calorie consumption was found within normal limits as per RDA standards.

Table 4: Energy consumption and distribution of medical students according to RDA*

Year & Sex	Energy(kcal) consumption/day (mean ± SD)	Less than RDA*	≥ Normal RDA*	Total
1st year				
Male	2291.23 ±856.69	18 (60.0)	12 (40.0)	30
Female	1932.25±957.78	10 (50.0)	10 (50.0)	20
2nd year				
Male	2737.09±1255.91	18 (51.4)	17 (48.6)	35
Female	1647.67±952.00	11 (73.3)	4 (26.7)	15
3rd year				
Male	3335.02±1452.05	10 (34.5)	19 (65.5)	29
Female	2245.71±1004.33	7 (33.3)	14 (66.7)	21
4th year				
Male	2827.85±976.97	11 (32.4)	23 (67.6)	34
Female	2227.29±785.92	5 (31.3)	11 (68.8)	16
	2517.77±1169.08	**90 (45.0)**	**110 (55.0)**	**200**

Figures in parenthesis indicate percentage

Table 5 depicts the consumption of different food items by the medical students of the college and its comparison with the normal RDA values prescribed by ICMR 2010. It revealed that mean values of consumption of cereals/ millets, pulses, fruits, sweets, meat, fish and eggs were found sufficient, more than RDA Standards in case of all students but vegetable consumption was insufficient. All the students except 3rd year males had their mean values of vegetable consumption less than that of RDA prescribed by ICMR 2010.

The consumption of different food items by all students of the study group and its comparison with the normal RDA values prescribed by ICMR 2010 is shown in Table 5. It was found that for all the students mean values of consumption of cereals/ millets, pulses, fruits, sweets and meat, fish and eggs were found sufficient and more than RDA standards, but intake of vegetables was insufficient and much less than that of RDA standards. The vegetable intake was found to be 68.32% in male and 65.78% in female students.

Table 5: Composition of different amount of food consumed by students its comparison with normal RDA*

	Foods	Normal RDA* (g/day)		Amount consumed ≥ RDA* Mean (%)		% consumed less than RDA	
		Male	Female	Male	Female	Male	Female
1st yr Students	Cereals & millets	375	270	748.45 (199.6)	503.00 (186.29)	More than RDA	
	Pulses	75	60	336.03 (448.04)	205.00 (341.67)	More than RDA	
	Vegetables	350	300	181.83 (51.91)	139.00 (46.33)	48.09%	53.67%
	Fruits	100	100	116.20 (116.2)	190.75 (190.75)	More than RDA	
	Sweets	20	20	213.27 (1066.35)	399.50 (1997.5)	More than RDA	
	Meat, fish & egg	25	25	278.20 (1122.8)	237.50 (950)	More than RDA	
2nd yr Students	Cereals & millets	375	270	930.14 (248.03)	609.00 (225.55)	More than RDA	
	Pulses	75	60	320.00 (426.67)	273.33 (455.55)	More than RDA	
	Vegetables	350	300	208.33 (59.52)	189.29 (63.9)	40.48%	36.1%
	Fruits	100	100	413.25 (413.25)	40.0 (40.0)	More than RDA	60.0%
	Sweets	20	20	412.80 (206.4)	78.57 (392.55)	More than RDA	
	Meat, fish & egg	25	25	334.00 (1336.0)	282.67 (130.68)	More than RDA	
3rd yr Students	Cereals & millets	375	270	1171.21 (312.32)	685.48 (253.55)	More than RDA	
	Pulses	75	60	317.25 (101.14)	312.0 (158.71)	More than RDA	
	Vegetables	350	300	384.25 (109.78)	267.21 (89.07)	More than RDA	
	Fruits	100	100	286.02 (286.02)	183.67 (183.67)	More than RDA	
	Sweets	20	20	508.08 (2540.41)	350.88 (1754.4)	More than RDA	
	Meat, fish& egg	25	25	436.61 (1746.44)	394.38 (1577.52)	More than RDA	
4th yr Students	Cereals & millets	375	270	1210.88 (322.4)	564.70 (209.148)	More than RDA	
	Pulses	75	60	313.53 (418.08)	235.38 (392.03)	More than RDA	
	Vegetables	350	300	205.88 (58.82)	194.37 (64.79)	41.18%	
	Fruits	100	100	161.85 (161.85)	142.19 (142.19)	More than RDA	
	Sweets	20	20	274.82 (1374.1)	385.63 (1928.15)	More than RDA	
	Meat, fish & egg	25	25	292.21 (1168.84)	439.69 (1758.76)	More than RDA	
Total (N= 200)	Cereals & millets	375	270	1016.76 (271.136)	592.02 (219.26)	More than RDA	
	Pulses	75	60	329.13 (438.84)	260.09 (433.48)	More than RDA	
	Vegetables	350	300	239.12 (68.32)	197.35 (65.78)	31.68 %	
	Fruits	100	100	237.76 (237.76)	144.69 (144.69)	More than RDA	
	Sweets	20	20	344.47 (1722.35)	316.79 (1583.95)	More than RDA	
	Meat, fish & egg	25	25	332.22 (1328.88)	333.36 (1333.44)	More than RDA	

*ICMR -2010[9]; Figures in parenthesis indicate percentage

Table 6 shows the consumption of different food items by the under-weight students of the medical college and its comparison with the normal RDA values prescribed by ICMR 2010. It was found that they consumed cereals /millets, pulses, sugar and non-veg. in adequate amount, but their vegetable intake was less than normal irrespective of sex as per RDA standards 2010.

Under-weight male and female students consumed only 73.33% and 68.48% of vegetables respectively compared to RDA standards. Also the under-weight females consumed fruits less than normal requirement by 13.19%. Thus, under-weight students were deficient in the consumption of vegetables and fruits.

Table 6: Consumption of different food items by the Under-weight Students (n=23)

Food items	Normal RDA* (g/day)		Amount consumed ≥ RDA* Mean (%)		% consumed less than RDA	
	Male	Female	Male (N=12)	Female (N=11)	Male	Female
Cereals & millets	375	270	647.5 (172.67)	556.8 (206.22)	More than RDA	
Pulses	75	60	350 (466.67)	204.54 (340.9)	More than RDA	
Vegetables	350	300	256.67 (73.33)	205.45 (68.48)	26.67	31.52
Fruits	100	100	172.91 (172.91)	86.81 (86.81)	More than RDA	13.19
Sweets	20	20	178.33 (891.65)	293.69 (1468.45)	More than RDA	
Meat, fish & egg	25	25	201.25 (805.0)	401.36 (1605.44)	More than RDA	

*ICMR -2010[9]; Figures in parenthesis indicate percentage

DISCUSSION

Nutritional survey of the students showed that out of 200 students, on whom the study was conducted, most of the students (91.0%) were non-vegetarian except 8.2% female and 9.04% male students as vegetarians.

Body Mass Index (BMI) was used to assess the nutritional status of the medical students as it is the most commonly used index of obesity or overweight, underweight and normal weight. In case of the females, the percentage of the students with normal BMI in the range of 18.5-25, increases from first year up to third year. The percentage of 4th year girls having normal BMI is less than that of 3rd year female students but higher than first and second year girls, but difference between girls years wise in normal BMI is not found statistically significant. In case of males, the percentage of students having normal BMI show inconsistency with age. Percentage decreases from 1st to 3rd year but increases in 4th year. The inconsistency of any particular trend may be attributed to cross sectional nature of data, variation in nutritional status, physical activity level or energy expenditure.

The highest chronic energy deficiency was seen in 23.3% males of first year followed by 10.3% males of third year and in 20.0% females of the second year followed by 18.8% and 15.0% females of fourth and first years respectively. Obesity was seen maximum in the 2nd year males (31.4%), followed by the 3rd year (24.1%) and forth year (17.6%) males. Among the females, it was highest in first year (25%). Overall, chronic energy deficiency was found to be more prominent among the 1st year college students. . The chronic energy deficiency was higher in females (15.3%) as a whole as compared to males (9.4%).

As against 2400 kcal of energy for sedentary adult males and 1920 kcal for sedentary adult females (like medical student), the energy consumption was found to be highest (3335.02± 1452.05) among the 3rd year male and lowest (1647.67±952.00) among the second year female students. More female students of 2nd year (73.33%) as compared to their male counterparts (51.40%) consumed inadequate calories, less than RDA[9]. The inadequacy of food energy consumption was so marked among the 2nd year females that only (1647.67±952.002) kcal were consumed as compared to 1920 kcal required per day and was lowest among all the students. As a whole the 1st year male and 2nd year female students have their calorie consumption less than the standard value prescribed by RDA[9]. Other students were found to consume calories within normal limits as per RDA standards.

For all students mean value of consumption of cereals/ millets, pulses, fruits, sweets and meat, fish and eggs were found sufficient and more than RDA standards, but intake of vegetables was insufficient. The mean values of vegetable consumption were found to be less than that of RDA as prescribed by ICMR 2010 for all students except third year male students. The situation

was not much better for the consumption of vegetables considering the study group as a whole and was found to be much less than RDA[9]. In male students the vegetable consumption (68.32%) was slightly higher than female (65.78%) students.

As a whole, 70% of the medical students have the normal BMI, 11.5% were under-weight, and 18.5% over-weight and 1% obese. The number of males and females having CED was respectively 12 (9.4%) and 11 (15.3%). The difference between the BMI of the different students could be due to some variations in socio-economic status, age, sex, income of family and also due to nutritional status.

In case of students whose BMI were found to be less, it was found that they consumed cereals / millets, pulses, sugar and non-veg in adequate amount, but their vegetable intake was less than normal irrespective of sex as per RDA standards-2010[9,10]. Under-weight males and females consumed only 73.33% and 68.48% of vegetables respectively which is less as per RDA standards, although they take other food items in adequate amounts. These females also consumed fruits less than normal requirement by 13.19%.

Thus, it is conclusive that the underweight students take vegetables and fruits less than normal. Hence their balanced diet is incomplete and may be a reason for their chronic energy deficiency. So they should take more vegetables and fruits.

Such variations in the nutritional status, BMI & percentage of veg, non-veg were also studied by other workers. Skimiene L[8] found that female students eat vegetables more frequently than men and Irena Colic Baric[5]et.al. also reported similar findings. Although, in the present study, male students were found to consume more vegetables (68.32%) than females (65.78%), the consumption was much less than RDA. Salve S.B, et.al[6]. showed that the recommended calorie intake was more in boys (39.15%) as compared to girls (27.88%). Colic baric Irena, et al[7] also established the same fact that 64.54% boys compared to 35.45% girls consumed energy as per RDA standards. The present study shows that the normal energy intake was only a little higher in boys (55.5%) than in girls (54.2%). In total, 45% students have their energy consumption less than RDA. Colic Baric I. et.al[7] reported in their study that 80.4% students were having normal BMI, which is quit high than 70% in the present study.

Thus, the study reveals that the nutritional status of the medical students of this college is not excellent. Hence, students should be more attentive towards their diet pattern, and should include more vegetables and fruits in their daily diet to increase their energy deficiency.

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