

Lifestyle, Nutritional Status and Physical Fitness Index among Healthy Male Students of Private Medical College

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Abstract

Aims & Objective: The aim of the study was to assess the nutritional status, lifestyle factors and physical fitness index among male medical students.

Material & Method: The present study was conducted among medical students aged 17-20. A total of 73 students completed the study. American dietetic society questionnaire was modified and was given to students. It included all the questions regarding 24 hour dietary recall, junk food consumption and few lifestyle factors. Calorie intake of individual student was calculated using ICMR guidelines. BMI was calculated using Quetelet's equation. BMI was classified into 4 categories on the basis of height for sex and age, BMI for sex and age and triceps skin fold thickness using reference data based on NHANES I. Physical fitness index [PFI] was measured by Harvard step test.

Results: It was observed that calorie intake was significantly high among at risk overweight & obesity boys compared with normal BMI group. Thinness group consumed less calories compared with normal BMI group which was statistically significant. There was positive correlation observed between body mass index & calorie intake. As expected, junk food consumption in obese was more as compare to normal group which was statistically significant. When PFI compared with nutritional status, physical fitness was less in all groups other than normal BMI group suggesting, boys with normal nutritional status show good PFI. There was negative correlation observed between body mass index & Physical fitness index in this study.

Conclusion: Findings in the study revealed that 24 hrs calorie intake and junk food consumption was found to be more in obese and at risk overweight group which was associated with reduced PFI. Therefore, students should be made aware of healthy food choices & well-balanced diet, healthy lifestyle and the implications of this on health & performance.

Keywords: Lifestyle, Body mass index, Nutritional status, Junk food, 24 hour Calorie, PFI.

1. Introduction

Medical students are expected to be more physically fit and dynamic with healthy lifestyles compared to the other student population as they are the future health care providers of the society. Developing country like India is being influenced by industrialization and a westernized lifestyle as a result younger generation has developed more attraction towards junk food and adapted unhealthy lifestyles. There is shift in nutritional and lifestyle habits due to popularity of fast foods, soft drinks, sedentary lifestyle, lack of exercise, increased television watching and computer use[1] This is more commonly seen among students belonging to rich affluent families opting admissions in private medical schools. Thus, there is rapid increase in overweight and obesity in adolescents which is becoming one of the biggest health problem facing the world's population.[2] It leads to more number younger population suffering from heart

diseases which is the number one killer in India. Among Asians, obesity is directly linked to Type-2 diabetes mellitus.[3]

Approximately, 80% of the heart disease, stroke and type-2 diabetes and 40% of cancers can be avoided through healthy diet, regular physical activity and avoidance of tobacco use.[4] Thus, there is need to examine factors that influence eating behavior and dietary quality particularly in adolescents. The food habits of adolescents are of special concern because this vulnerable group has greater energy and nutrient requirement than adult population.[5]

The rigors of education are stressful for many medical students, and common maladaptive responses to stress include physical inactivity and poor nutrition. This in turn can produce deleterious effects on physical well-being and mental health.[6] It is more likely that physical and mental processes influence each other in ways that are still being understood.[7]

Patients have greater confidence in the health advice received from physicians they perceive to be healthy.[6] Having a low fitness level, on the other hand, proved to be as risky as being a smoker.[8] This study adds to the literature regarding effect of nutritional habits and lifestyle factors on Physical fitness index and creates awareness of health issues associated with poor nutritional status and lifestyle.

2. Material and Methods

This cross-sectional study was conducted among 73 male medical students to assess lifestyle, Nutritional status and Physical fitness index. A written informed consent was obtained from the participants. Information about name, age, sex, and nativity was collected. American dietetic society questionnaire which was modified considering regional food habits, was used to collect 24 hr dietary intake, junk food consumption and few lifestyle factors such as smoking habits, alcohol intake, frequency of exercise, yoga, sleep habits etc. Each subject was personally assisted by the investigator in answering the questionnaire. The participants were instructed to refrain from any strenuous exercise 24 hrs prior to the study and to maintain their nutritional habits prior to and during testing. They were asked to consume light breakfast in the morning and not to take any medications or supplements prior to and during the study.

List of Variables-

A) Height: It was measured by Commercial stadiometer to the nearest 0.5 cm.

NCHC/WHO reference data based on height for age was used in the present study to define stunting.[9]

B) Weight: It was recorded by Digital scale with an accuracy of +100gm

C) BMI: It is calculated by from height and weight using **Quetelet's equation.**

$$BMI = \text{body weight (in Kg)} / \text{height (in meters)}^2$$

BMI percentile charts of WHO based on the first National Health and Nutrition Examination Survey (NHANES I) were used to define thinness and at risk of overweight.[10]

D) Triceps skin fold thickness (mm): A Vertical fold, on the posterior midline of the upper arm, half way between acromion and olecranon process was measured by Herpenden skin fold calipers (Anand agencies, Pune). Mean of 3 measurements were considered. TSFT percentile charts of WHO based on the Health Examination Survey and the first National Health and Nutrition Examination Survey (NHANES I, 1991) in the United States of America were used to define obesity.[9,10]

E) Physical fitness index [PFI]: It was measured by Harvard step test method. Following equation was used to calculate PFI –

$$\text{Physical Fitness Index (PFI)} = \frac{100 \times \text{test duration in seconds}}{5.5 \times \text{pulse count between 1 and 1.5 minutes}}$$

F) 24 hour calorie calculation: Information about 24 hour dietary intake was collected by personally assisted questionnaire. Calories for individual student was calculated using ICMR guidelines.[11]

Recommended cut-off values which were used to classify PFI into three categories

PFI	Category
<50	: Poor
50-80	: Average
>80	: Good

Recommended cut-off values which were used to define:-

1) Stunting, 2) thinness, 3) at risk of overweight and 4) obese

All subjects who had height < 3rd percentile for sex and age were defined as **stunt**. All subjects who had a BMI < 5th percentile and BMI >85th percentile for sex and age were defined as thinness and overweight respectively. All subjects who were at risk of overweight were further screened by measuring triceps skin fold thickness (TSFT) over the left arm and the mean of three readings was taken. Students whose mean TSFT was 90th percentile for sex and age was considered obese.[9]

2.1 Statistical Analysis

The data for the group (73) were averaged and expressed as mean + standard deviation. Means were compared between 4 groups using ANOVA test to analyze the relationship of BMI with PFI and 24 hour calorie intake between normal, thinness, at risk of overweight and obese group. Other tests used were unpaired t test and Fisher exact test and chi square test. Difference between mean of the two groups was tested using Student's unpaired 't' test. Fisher exact test was used to compare three or more than three variables. Chi square test was used to test association between two variables. Correlation of BMI with both PFI and 24 hour calorie was also calculated. Statistical results were considered significant at p<0.05.

3. Results

BMI was calculated in 73 students considering their height & weight. Students were classified into 5 categories. None of the students came into stunting category. Further classification was as follows:

Table 1: Distribution of students in 4 groups based on BMI

BMI Groups-	Normal	Thinness	At risk of overweight	Obese
Number of students	57(78.1%)	3(4.1%)	3(4.1%)	10(13.7%)

Out of 73 students, 57(78.1%) students classified as normal BMI, 3(4.1%) as thinness, (4.1%) as at risk of overweight and 10 (13.7%) students under obese group.

Table 2: Distribution of students in 3 groups based on PFI

PFI Groups-	Poor	Average	Good
Number of Students	0	35 (48%)	38 (52%)

Among 73 students, 38(52%) students showed Good PFI, 35(48%) had Average PFI and none of the student had Poor PFI.

Table 3: 24 hour calorie in 4 groups of BMI

BMI Groups	Normal	Thinness	At risk of overweight	Obese
24hour calorie (Mean + SD)	2647.9 + 247.83	2250 + 589.49	2790 + 36.05	2891 + 143.71

F = 5.791 p = 0.001

More consumption of calorie was observed by normal BMI students than thinness group which was statistically significant. Obese group consumed more calorie than normal which was also statistically significant (p<0.05). At risk group and obese subjects consumed more calorie than thinness which was statistically significant. However, difference in calorie consumption between at risk of overweight & normal subjects was not statistically significant.

Table 4: Junk food calorie in 4 groups of BMI

BMI Groups-	Normal	Thinness	At-risk-of overweight	Obese
Junk food calorie (Mean+ SD)	382+ 176.2	300+ 100	516+ 332.9	630+ 145.7

F=6.255, p= 0.001

As expected, there was more consumption of junk food observed in obese group compared to normal group which was statistically significant (p=0.001). Thinness group consumed less junk food calorie compare to obese group which was statistically significant (p=0.037). However, at risk of overweight group consumed more junk food as compared to normal group which was not statistically significant.

Table 7: Number of students with lifestyle habits

Smoking History 7 (9.6%)		Alcohol consumers 22 (30.1%)			Exercise/week 52 (71.2%)	Yoga/week 7(9.6%)	Junk food 73 (100%)		
*CS	**ES	Daily	2-3times/ week	Rarely			Daily	1-4times/ week	Rarely
3 (4.1%)	4 (5.5%)	1 (1.4%)	2 (2.7%)	19 (26%)	52 (71.2%)	7(9.6%)	10 (13.7%)	50 (68.4%)	13 (17.8%)

*CS-Current smoker, **ES-Ex Smoker

Among 73, 7(10%) students had smoking history (3-current smokers & 4- Ex smokers), 22 (30%) students consumed alcohol (1-daily, 2- 2-3times/week, 19-rarely), 52 (71%) students exercised & 7 students practiced Yoga at least once a week. All students consumed junk food (10-daily, 50-1-4times/week, 13-rarely).

4. Discussion

In the present study most of the boys (78%) belonged to normal BMI group. Ten boys (13.7%) were in obese group. Minimal number (4%) of students belongs to IJBAR (2016) 07 (12)

Table 5: Physical fitness index among 4 groups of BMI

BMI Groups	Normal	Thinness	At risk of overweight	Obese
Physical fitness index (Mean +SD)	84.4+ 14.56	71.3+ 7.75	69.6+ 5.26	72.8+ 9.11

F = 3.545 p = 0.019

It was observed that compared to normal BMI students, PFI was reduced in all three groups, thinness group, at risk of overweight group and obese group. However, a decrease in PFI observed between normal group & thinness group, normal & obese group was not statistically significant (p>0.05), Physical fitness index of obese group was more compared to at risk of overweight group which was not statistically significant (p>0.05). Physical fitness index was less in at risk of overweight group compared to normal group which was statistically significant (p<0.05).

3.1 Correlations

There was inverse correlation of BMI with Physical fitness index which was statistically significant [(r = -0.375), p = 0.001]. Positive correlation of BMI with 24hour calorie intake [(r =0.246), p=0.036] and junk food calorie intake [(r=0.271), p=0.020] was observed which was statistically significant.

Table 6: Comparison of BMI categories with PFI categories

BMI Categories	PFI Categories	
	Average	Good
Normal (n=57)	22 (38.6%)	35 (61.4%)
Thinness(n=3)	2 (66.7%)	1 (33.3%)
At-risk-of overweight (n=3)	3 (100%)	0
Obese(n=10)	8 (80%)	2 (20%)

Fisher exact test, p = 0.010

Out of total 57 who had normal BMI, 61.4% showed good PFI. Among the 10 obese students, 20% had good PFI which was statistically significant.

Thinness & at risk of overweight group. (Table 1) None of the students had Poor PFI. 52% students showed Good PFI, and 48% had Average PFI. (Table 2) It was observed that calorie intake was significantly high among at risk overweight & obesity boys compared with normal BMI group. Thinness group consumed less calories compared with normal BMI group which was statistically significant. There was positive correlation observed between body mass index & calorie intake. (Table 3) This finding was consistent with a study conducted by Céline Bonnet *et al*[12] which reported that individual food consumption is clearly increasing with

the BMI. Overweight and obese people consume more lipids than lean people. In contrast with this finding, another study conducted by Jetson E. Lincolon (1972)[13] reported that more obese consumed no more calories than the less obese groups. This study also reports physical activity levels of the more obese groups were not lower than those of the less obese groups.

In the present study all boys consumed junk food in their diet but at risk of overweight & obese students consumed more junk food compared to normal BMI group. The more calories obtained from junk food in obese group was statistically significant.(Table 4)

When PFI compared with nutritional status, physical fitness was less in all groups other than normal BMI group suggesting, boys with normal nutritional status show good PFI. Boys at risk of overweight & having obesity showed lesser PFI. There was negative correlation observed between body mass index & Physical fitness index in this study. (Table 5) Similar results were found by Vahid Ziaee *et al.*, (2004)[14] which also showed the inverse relationship between BMI & health related fitness tests.

The finding in the study reveals that, on comparison of BMI categories with PFI categories 61.4% of normal BMI students (57) and only 20% of obese students (10) showed good PFI which was statistically significant.(Table 6)

Among 73 boys, 9.6% students had smoking history, 30% students consumed alcohol & 71% students performed exercise once a week. It was also found that 100% of the students consumed junk food. (Table 7) Earlier study conducted by Thilakarathne *et al.*, (2011)[15] among children of primary school which reported that television viewing or computing was significantly high among boys. Children who engaged in watching television while consuming food reported poor diet consuming comparatively small quantities of vegetables, green leaves, and fruits daily with a high habitual intake of soft drinks, and fast foods. Overweight and obesity are emerging at an alarming rate, with boys particularly at risk.

5. Conclusion

The results of the present study revealed statistically significant better physical fitness index in normal BMI group as compared to at risk of overweight group. Physical fitness index normal group was more as compared to thinness and obese group which was not statistically significant. There was statistically significant more consumption of 24 hour calorie intake by obese group as compared to normal group. There was more consumption of junk food in obese group compare to normal group and thinness group which was statistically significant. Among total boys 10% students had smoking history, 30% students consumed alcohol & 71% students performed exercise once a week.

Nutritional status in most of the students of private medical college is normal. 24 hour calorie intake and junk food consumption by obese and at risk Overweight group was more as compared to normal group which lead to reduction in their physical fitness index. Moreover many students had good lifestyle habits like exercise & yoga but few had smoking and alcohol history also which also lead to their low fitness level.

Additional research with larger samples and longer follow-up intervals is required to know other dietary & lifestyle habits in detail. Students should be made aware of healthy food choices & well-balanced diet, healthy lifestyle and the implications of this on health & performance. As future doctors, students must adopt good dietary habits & good lifestyle practices to attain a better quality of life.

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