Research Article

A study to know the incidence of obesity in medical students and its correlation with physical fitness

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Abstract

The study to know the incidents of obesity in medical students and its correlation with physical fitness is of great significance as medical students are highly susceptible to develop obesity during medical studies due to the time consuming demands, which leaves minimal time for physical exercise and physical activity. Obesity is well known disorder of the 21st century which is constantly on the rise, carrying with it the vast Variety of health related factors. The study is aimed to find out the incidence of obesity in medical students and its correlation with physical fitness. The medical students included in the study were of the age groups between 18 to 24 years. The study included 200 medical students of which 98 were males and 102 were females. The students were examined thoroughly, so as to exclude those suffering from major diseases, psychological problems and those on medication. Obesity was determined by calculating the BMI according to the American journal of clinical nutrition[1]. And the grading of obesity into various grades between 18.5 to 24.9 kg/m^2, was done according to WHO. Physical fitness was determined by measuring the physical fitness index, which was calculated by measuring the heart rate (HR) after performing the Harvard's step test (HST)[2]. A modified HST was used for Indian conditions. A questionnaire was also used to access exercise habits and body imaging. After appropriate statistical analysis and assessment it was observed that 48 (24%) students belonged to the overweight category with BMI ranging from 30.0 to 39.9. Maximum number of students i.e. 70 (35%) had physical fitness index which was below average (50 – 60). While only 8(4%) students had excellent physical fitness index (>80 %). Majority of the students 137 (68.5%) had a routine habit of exercising only about 0-2 times a week. There was significant negative correlation observed between BMI and physical fitness. Higher BMI i.e. 25.0 – 29.9 (grade 1 overweight) was observed in that category of students having lower physical fitness index i.e. 50 – 60 (below average).

Keywords: Obesity, physical fitness and exercise habits, Medical field.

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INTRODUCTION

As the famous proverb says "all work and no play makes jack a dull boy" physical activity and physical fitness is an essential part of a healthy living. As the lack of physical fitness and physical activity in this 21st century is on the rise, technology and the other luxuries of this modern age don't make that any more difficult, as these are in context with the general population, medical students moreover have to deal with the academic demands and the time consuming curriculum of medical education which leaves them with a very little time for exercise. Medical students on the other hand tend to neglect exercise and physical activity as a compensation so as to stay on top and on the edge of medical education and medical advancements in this highly competitive field. What medical students don't realize is that the little time they neglect for exercising actually costs them more of their academic performance and learning ability, as their lacking for exercise and physical activity gradually tends to develop Overweight and obesity eventually leading to an unhealthy, unenergetic and lazy individual with decreased intellectual capabilities. In this 21st

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century obesity is one of the major concerns of the general population .As the effects and risks of obesity on health are familiar with most people. Health related risk factors being the main aspects of the obesity are not always the reasons of concern of the general population. Obesity also has a lot to do with glamour and the aesthetic demands of the 21st century. Along with the major health risk factors obesity brings, such as hypertension, Type II diabetes mellitus, infertility, hyperlipidemia and increased risk for coronary disease[3], it also has a negative effect on an individual's physical fitness and mental abilities, and as we know from a number of studies the two are correlated. Many studies have been done on obesity correlating it with a number of parameters like diet, Lifestyle, hereditary factors and even incidents in different geographic areas, but studies of incidence of obesity in medical students and its correlation with lack of physical fitness, which is mainly seen in medical students, is almost non-existent. Many of the students are physically fit and non-obese during high school but gradually tend to develop obesity during medical studies, due to the transition and sudden changes brought about by the demands of medical studies. Medical students are at a higher risk of developing obesity because of the life style and the time consuming demands of medical studies. The average lifestyle of a medical student involves very little time for physical activities leading to Lack of physical fitness. Recently it has been observed that medical students have a anti-obesity bias towards their patients. They often associate obese individuals with negative attributes and laziness. On average, medical students and physicians share the general population's anti-obesity bias. When medical students and professionals can have such a bias, what's to stop patients from having an anti-obesity bias towards their doctor, associating an obese doctor with negative attributes and laziness?

MATERIALS AND METHODOLOGY

200 medical students in the age groups of 18 to 24 years were included in the study. All the subjects were thoroughly examined with particular emphasis on history of disease, psychological problems and drug history. Obesity was determined by using the BMI formula according to the American journal of clinical nutrition[1]. Grading of BMI was done according to W.H.O grading.

Sr. No.	BMI	Grading
1.	<18.5	Underweight
2.	18.5 – 24.9	Normal
3.	25 – 29.9	Overweight
4.	>30	Obesity

- Mean BMI was 22.74/kg/m^2.and SD was 3.71
- Physical fitness was determined by measuring the physical fitness index, which was calculated by measuring the heart rate (HR) after performing the Harvard's step test (HST) [2]. A modified HST was used for Indian conditions[5]

Harvard's step test (HST) developed by Brouha *et al.* in the Harvard Fatigue Laboratories using long form PFI equation however, following modified HST under Indian conditions. Using a stool of 51 cm high stepping up and down, with a rate of 30 cycles/min, for 3 min or up to exhaustion. Exhaustion is defined as when the subject cannot maintain the stepping rate for 15 seconds[5].

- The recovery pulse was counted at 1-1.5, 2-2.5 and 3-3.5 min of recovery.
- Long Form Equation –

$$\text{Physical fitness Index} = \frac{100 \times \text{test duration in seconds}}{2 \times \text{recovery HRs (1-1.5 min + 2-2.5 min + 3-3.5 min}}$$

- Average values : (60-70)
- A questionnaire was also used to access exercise habits and body imaging[6].

The grades of physical fitness were obtained after grading the physical fitness index into five grades:

Sr. No.	Physical fitness index	Grading
1.	<50	Poor
2.	50-60	Below average
3.	60–70	Average
4.	70-80	Above average
5.	>80	Excellent

- The mean physical fitness of the students who participated in the study is 61.2475 and the standard deviation was 8.60262.

A questionnaire was also used to access exercise habits and body imaging. Which consisted of questions on[6].

1. Frequency of exercise
2. Intensity of exercise
3. Type of exercise
4. Reason for exercising
5. And how one felt about their own body

STATICAL ANALYSIS

Proportion and percentage were obtained for qualitative data, whereas mean and standard deviation were obtained for quantitative data. Chi – square test was applied to check the association of BMI with different parameters included in the study. Correlation was obtained to check the relationship between BMI, and physical fitness. Analysis was done by using Microsoft excel and SPSS 22.

RESULTS

Table 1: Charactersitics of participating students

Characteristics	# of participants	% of participants
Gender		
Male	98	49%
Female	102	51%
	AGE (YEARS)	
18-20	101	50.50%
20-24	70	35.00%
22-24	29	14.50%
Body mass index		
<18.5	26	13%
18.5-24.9	116	58%
24.9-29.9	48	24%
>30.0	10	5%
Physical fitness index		
Excellent /9.80)	6	3.00%
Above average (70-80)	31	15.50%
Average (60-70)	71	35.50%
Below average (50-60)	69	34.50%
Poor (<50)	23	11.50%

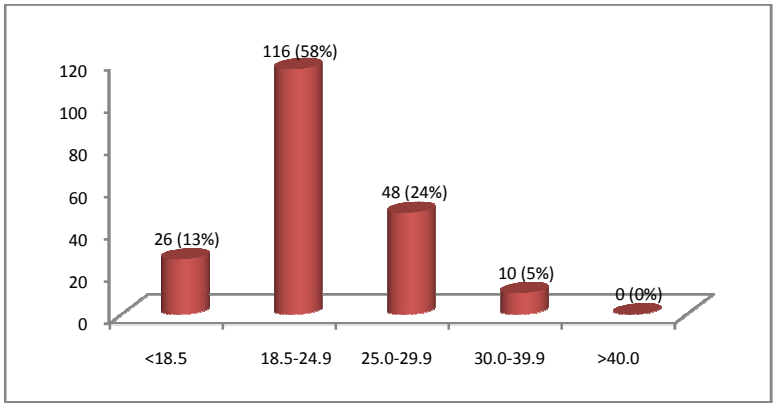

Figure 1: BMI distribution of participated students

Association and correlation tables

Table 1: Showing the association between BMI and physical fitness

BMI	Physical fitness index					Total
	<50 poor	50-60 Below average	60-70 average	70-80 Above average	>80 excellent	
<18.5	4	10	10	1	1	26
Underweight	16.00%	40.00%	40.00%	4.00%	0.00%	100.00%
18.5-24.9	1	30	54	26	5	116
Normal	0.80%	26.10%	46.20%	22.70%	4.20%	100.00%
25-29.9	12	29	5	1	1	48
Grade 1 overweight	24.50%	61.20%	10.20%	2.00%	2.00%	100.00%
>30	6	1	1	1	1	10
Obesity	60%	10.00%	10.00%	10.00%	10.00%	100.00%
Total	**23**	**70**	**70**	**29**	**8**	**200**
	11.50%	**36.00%**	**35.00%**	**14.50%**	**3.00%**	**100.00%**

Pearson chi-square – 81.564, P value – 0.000,
There is significant association between BMI and physical fitness index

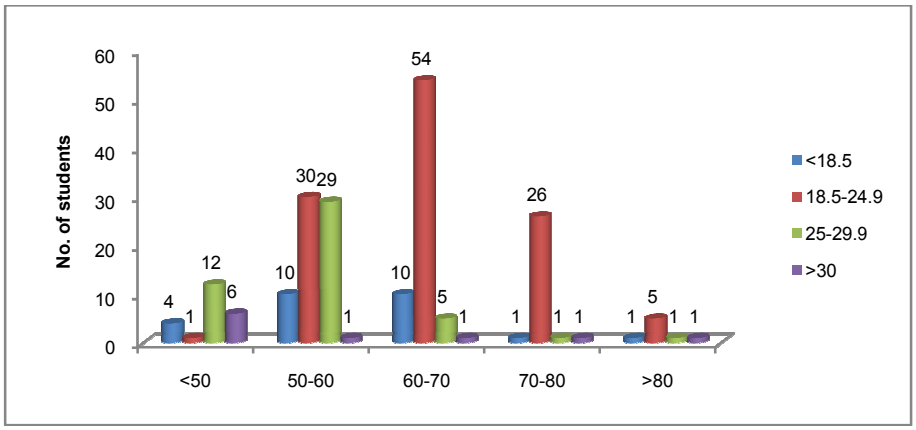

Figure 2: BMI and physical fitness index

Table 2: Table showing the correlation between BMI and physical fitness

Correlations		Physical fitness
BMI	Pearson correlation	-.415**
	P value	0.000

There is also low degree negative and significant correlation between BMI and physical fitness

Table 3: Results of questionnaire on exercise and body image

Question	Number of students	Percentage of students
How often do you exercise?		
I exercise 0-2 times per week	137	68.50%
I exercise 3-4 times per week	42	21.00%
I exercise 5 or more times per week	21	10.50%
At what level of intensity do you exercise?		
Light	123	61.50%
Moderate	70	35.00%
Heavy	7	3.50%
What type of exercise do you usually do?		
Cross-training	2	1.00%
Aerobic	27	13.50%
Strength-training	31	15.50%
Competitive sports	43	21.50%
Combination	25	12.50%
Other	72	36.00%
How do you feel about your body?		
I feel confident with how my body looks	75	37.50%
I feel somewhat confident with how my body looks	82	41.00%
I don't feel confident with how my body looks	43	21.50%

Stated Reason	Number of students	Percentage of students
Weight Loss/ Maintain Weight	72	36.00%
Stress Relief	42	21.00%
Enjoyment	26	13.00%
Gain Muscle/Strength/Fitness	54	27.00%
Other	6	3.00%

DISCUSSION

In this study 200 M.B.B.S. students of the bharati vidyapeeth medical college, sangli ranging from the age groups between 18 to 24 years were involved in the study. Majority of the students belonged to the first year and the age group 18-20 years. While the next majority of students were from the second year. Out of the 200 students 185 were Indians and 15 were Nigerians. There were a total of 102 female students and 98 male students that were included in the study. 48 students i.e., 24% were overweight with a BMI ranging from 25.0 to 29.9. The increasing severity of difficulty in sleep quality or the

lack of physical activity and exercise may have been contributing factors in the development; the dietary habits of students may have also contributed. While the majority of the students, adding up to 116 i.e., 58% were in the normal category with a BMI ranging from 18.5 to 24.9. A smaller group of students were found to be in the underweight category with a BMI less than 18.5. While a minimal but yet concerning number of students 10 i.e., 5% were found to be obese with a BMI ranging from 30 to 39.9. the results were comparable to earlier studies done by Gopalkrishnan S, Ganeshkumar P on prevalence of obesity/overweight among medical students, Malaysia[7]. On analysis and study of the physical fitness index, maximum number of students 71 i.e., 35.50% had an average physical fitness (60-70).a close majority of students 69 i.e., 34.5% had a physical fitness index below average (50-60). While the minimum number of students 6 i.e. 3% had an excellent physical fitness index. On association with BMI groups there was significant association between the two. This is one of the major reasons for medical students developing obesity, due to the lack of time or the sacrifice of exercise for academic success. There was statically significant association and highly significant negative correlation between BMI and physical fitness index. When considering exercise and physical fitness routine, it was observed that majority of the students 137 students i.e., 68.5% had a regularity of exercising only about 0 to 2 times a week. .while only 42 students i.e., 21% had a regularity of exercising 3-4 times in a given week. Only 21 i.e.10.5% students were found to be exercising 5 times or more in a week. This may be a result of the strenuous schedule and time consuming demands of medical studies which leaves students with inadequate time and a minimal importance for exercising and maintaining ones physical fitness. There was statically significant association and highly significant association between BMI and physical fitness.

CONCLUSION

The students involved in the study had a significant overall number of incidences of obesity. Majority of these students showing signs of obesity were grade 1 overweight while a few were obese. The medical students involved in the study show alarmingly low levels of physical fitness amongst the majority of the students. Majority of the students are not involved in physical activity or exercise on a daily basis, while a low number of students exercise occasionally or on a weekly basis. The intensity of which the few students performing physical exercise is light. There was statically significant association and highly significant negative correlation between BMI and physical fitness. Proper awareness and education at a very early stage of medical studies along with involvement of the institution and medical staff is very important in preventing the development of obesity amongst medical students and doctors. Similarly it is very important to impress the consequences of low sleep durations, lack of physical exercise and unhealthy dietary habits on a medical student's physical as well as mental health.

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