

## Prevalence of obesity among the medical students: a cross sectional study in a south Indian medical college

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**Abstract:** *Introduction:* In recent years obesity has become very common health concern worldwide. Much debate has been generated regarding the increasing incidence of obesity among children and adolescents with respect to their long term health benefits. Obesity has always been associated with what we eat and how we eat. Thus, the objective of our present study was to determine the relationship between eating speed and obesity among medical students of Melaka Manipal Medical College, Manipal, India. We also aimed at finding out the factors that affect the eating speed of a person. *Methods:* A survey was conducted for the first year medical students of MMMC, Manipal campus. The participants consisted of 506 students aged 18-24 years. The survey included a self-administered questionnaire. The questionnaire included a diet history items that required recall of dietary habits over 2 months. Weight and height of the participants were taken in order to calculate Body mass index (BMI), which was calculated as weight in kilograms divided by the square of height in meters. Comparison between the speed of eating and the BMI values were obtained for analysis. *Results:* Our results showed that the majority of the obese subjects are linked to very fast eating rate which is less than 15 minutes. It is made up of 65% of the total number of subjects in obese category. *Conclusion:* Our study, found a positive correlation between the eating rates and BMI in students between the age group 18-24. This shows that the rate of eating can be a causative factor for obesity.

**Keywords:** Obesity, Eating speed, Body mass index, Medical students

### Introduction

In recent years obesity has become very common and an increasing health burden worldwide. Obesity is an increase in body weight as the result of excessive accumulation of body fat. The body weight depends on the balance between caloric intake and utilization of calories. Obesity results when the caloric value of food intake exceeds energy output. A person is considered obese if they have a Body Mass Index (BMI) - of 30 or greater. Raised BMI is the risk factor for chronic diseases such as hypertension, Type II diabetes mellitus, infertility, hyperlipidemia and increased risk for coronary disease [1]. Much concern has been generated about the increasing incidence of obesity among children and adolescents with respect to their long term health benefits. Obesity has always been regarded with what we eat and how we eat. Eating while watching television is known to contribute to obesity and is attributed to the increased frequency of consumption of high density food [2]. Studies on eating behavior have shown that obese subjects took more bites,

performed more chews per bite and spent less time chewing than the non-obese subjects [3]. This indicates that eating habits and patterns do have an important part in obesity. Thus, the objective of our present study was to determine the relationship between eating speed and obesity among medical students of Melaka Manipal Medical College (MMMC), Manipal, India. We also aimed at finding out the factors that affect the eating speed of a person contributing to the occurrence of obesity among these students.

### Material and Methods

A survey was conducted among the first year medical students of MMMC, Manipal campus. The participants consisted of 506 students aged 18-24 years. The survey included a self-administered questionnaire. The questionnaire included a brief diet history item that required dietary habits over 2 months. For the question: 'How fast do you eat?' the rate of eating was self-reported by an

answer chosen from five quantitative categories, that is, 'less than 15 mins', '15 to 30 mins', '30 to 45 mins', '45 mins to 1 hour', and 'more than an hour'[4].

Weight and height were measured and collected by the participants. Body mass index (BMI) was calculated as weight in kilograms divided by the square of height in meters. These BMI values were then categorized into four categories, that is, 'under weight with BMI less than 18.5', 'normal weight with BMI between 18.5 to 24.9', 'overweight with BMI from 25 to 29.9', and 'obese with BMI more than 30' [5]. Comparison between the speed of eating and the BMI values was obtained for analysis purposes. The formula of 'Very fast eating rate divided by total number of people in particular BMI category' was used to relate the relationship between obesity and speed of eating.

### Results

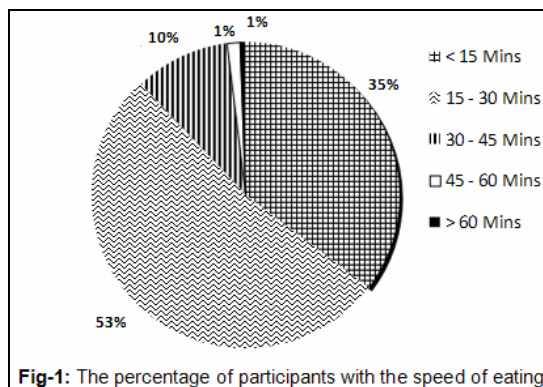


Figure-1: Indicates the percentage of participants in relation to their speed of eating. 35% of the participants had a very fast eating rate, 3% had fast eating rate, 10% moderate rate and 1% had slow rate of eating.

Eating rates	Very slow (> 60 mins)	Slow (45 –60 mins)	Moderate (30 –45 mins)	Fast (15 –30 mins)	Very Fast (<15 mins)	Percentage (%)**
No. of people (506)	3	7	51	269	176	
<b>BMI</b>						
< 18.5 (Under wt)	-	3	9	58	17	20
18.5-24.9 (normal)	3	4	41	188	135	36
25-29.9 (Over wt)	-	-	1	16	11	39
>30 (Obese)	-	-	-	7	13	65
** Very fast eating rate divided by total number of people in particular BMI category Eg: For obese category, 13/20 x100= 65%						

Table 1 shows the relationships between eating rates and different BMI categories. It shows that majority of the obese subjects are linked to very fast eating rate which is less than 15 minutes. It is made up of 65% of the total number subjects in obese category. This is followed by 39% of the overweight subjects with very fast eating rate. In contrast, subjects in normal weight category and in underweight category who linked to very fast eating rate are only consist of 36% and 20% respectively with a total of 56%.

### Discussion

There was a positive association between the self-reported rate of eating and current BMI among

healthy young adult men and women. Moreover, we demonstrated that the rate of eating was positively associated with BMI at the age group ranges 18 - 24. Our results include the different eating rates with different BMI categories. In our study, current BMI steadily increased along with the increase in the rate of eating in agreement with our result. Our results were obtained from a survey answered by male and female college students and therefore, it may add information to generalize the theory that eating fast leads to obesity. In our studies, we found out that obese people have a higher percentage of eating very fast and this result is strongly

supported by many studies associated between fast eating and obesity even in childhood [1]. To elaborate on that, there are studies which reported that the eating rates were affected by television viewing, the number and the type of food intake while watching television, reduced physical activity due to television viewing and these factors have more or less caused the abnormal weight gain in childhood [6].

The mechanism underlying the relationship between the rate of eating and obesity would be the increase in energy intake in the fast eater because energy intake per day increased significantly with the increase in the rate of eating. Interestingly, the number of bites and the frequency of mastication also play a role in changing the eating rates. Additionally, other unknown factors might mediate the relationship between fast eating and obesity; for example, mental stress might be a confounding factor. Mental stress or psychological workload has been reportedly associated with obesity. If busy students are under mental stress for example before or during examinations, they cannot help eating fast owing to the limited time for eating, a positive association may develop between rapid

eating and obesity [1, 7]. Recent studies have shown compelling evidence that inter-individual differences in susceptibility to obesity have strong genetic determinants. More studies are needed to better understand how specific genetic factors may affect eating speed and obesity.

However, this cross sectional study focusing on only the young age group might benefit us in giving more emphasis on the influence of eating rates on different BMI categories. Therefore, various ages, in this case, are not the limiting factor that contributes to the changes in BMI. In conclusion, we found a positive association between the eating rates and BMI over the age ranges from 18 – 24. Our results thus suggest that the rate of eating can be a causative factor for obesity.

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