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**C Abhaya Prakash**  
Research Scholar, Dept of  
Physical Education and P G  
Studies & Research Centre,  
Mangalore University,  
Mangalore, and S.J.M. College of  
Arts, Science & Commerce,  
Chandravalli, Chitradurga,  
Karnataka, India.

**Maqsood Ahamed**  
Assistant Professor in Physical  
Education, Dept of Physical  
Education and P G Studies &  
Research Centre, Mangalore  
University, Mangalore, and  
S.J.M. College of Arts, Science &  
Commerce, Chandravalli,  
Chitradurga, Karnataka, India.

**Correspondence**  
**C Abhaya Prakash**  
Research Scholar, Dept of  
Physical Education and P G  
Studies & Research Centre,  
Mangalore University,  
Mangalore, and S.J.M. College of  
Arts, Science & Commerce,  
Chandravalli, Chitradurga,  
Karnataka, India.

## Pattern of BMI among adolescents involved in sports activities

**C Abhaya Prakash, Maqsood Ahamed**

### Abstract

World Health Organization's latest projections indicate that globally in 2005, approximately 1.6 billion adults were overweight and at least 400 million adults were obese. World Health Organization further projects that by 2015, approximately 2.3 billion adults will be overweight and more than 700 million will be obese. Body mass index is calculated based on physical measurements such as height and weight. BMI = weight (kg)/height (m)<sup>2</sup> National Centre For Health Statistics/CDC -2000 growth charts for children and adolescents aged 2-20 years i.e. BMI for age and sex percentile growth curves are used to classify the subjects as overweight and obesity. The combined prevalence of overweight and obesity is 19.2%. The prevalence of overweight alone is 12.4% and whereas obesity is 6.8%.

**Keywords:** BMI, Sports persons, Adolescents

### Introduction

Obesity is a complex condition with serious social and psychological dimensions, that affects virtually all age and socioeconomic groups and threatens to overwhelm both developed and developing countries. This problem is increasing in adolescents and various factors contribute to it. <sup>[1]</sup>

Obesity can be seen as the first wave of a defined cluster of non-communicable diseases called "New World Syndrome" creating an enormous socioeconomic and public health burden in poorer countries <sup>[2]</sup>. Obesity is a global nutritional concern. The increasing prevalence of overweight, obesity and its consequences prompted the World Health Organization to designate obesity as a global epidemic. World Health Organization's latest projections indicate that globally in 2005, approximately 1.6 billion adults were overweight and at least 400 million adults were obese. World Health Organization further projects that by 2015, approximately 2.3 billion adults will be overweight and more than 700 million will be obese <sup>[3]</sup>. The problem of obesity is confined not only to adults but also to children and adolescents. Various studies also indicate that the prevalence of overweight and obesity amongst children of all ages is increasing in developing countries in the past few decades <sup>[4, 5]</sup>. Figures on the global prevalence of childhood obesity have been compiled by the World Health Organization where several developing countries such as Nicaragua, Brazil, Antigua, Zambia, Venezuela and Peru, show a prevalence rate of over 2%. Countries such as Barbados, Honduras, Lesotho, Bolivia, Trinidad, Iran and Mauritius have > 4% prevalence, while Jamaica and Chile top the list with 10% greater prevalence rate in school children<sup>6</sup>. There is only limited data on the prevalence of obesity among adolescents in India.

### Methodology

Data was collected using a pre-tested self-administered questionnaire distributed in the classroom after telling them what the study is about and taking the verbal consent of the students. Each question was explained while the students filled them up with clarification of doubts. Questions were asked about identity, socioeconomic status, family history. Simultaneously, height and weight were measured.

Height was taken using a standard three piece anthropometric rod at their classrooms corrected up to 1mm. students were asked to stand upright against a wall with the heels touching the wall and the chin held horizontally so that the tragus of the ear and the eye are in a straight line, then the rod was adjusted and the height in cm was read. Weight of all students was taken

using bathroom scales calibrated at the legal Metrology department and corrected with a lever balance up to 0.5 kg and calibrated daily for zero error. The students were asked to stand upright, bare footed on the weighing machine looking straight while the measurement was read. A measurement called percentile of Body Mass Index (BMI) is used to identify overweight and obesity in study subjects.

Body mass index is calculated based on physical measurements such as height and weight.

$BMI = \text{weight (kg)} / \text{height (m)}^2$  National Centre For Health Statistics/CDC -2000 growth charts for children and adolescents aged 2-20 years i.e. BMI for age and sex

percentile growth curves are used to classify the subjects as overweight and obesity.

The classification adopted in this study is, Weight Status Category Percentile Range Underweight - Less than the 5th percentile

Normal weigh - 5th percentile to less than the 85th percentile

Overweight - 85th to less than the 95th percentile

Obese - Equal to or greater than the 95th percentile

Data was compiled using Microsoft Excel software and analyzed using SPSS

## Results

Variables	Underweight	Normal weight	Overweight	obesity	Total
<b>Overall</b>	165 (20.8%)	475 (59.9%)	98 (12.4%)	54 (06.8%)	792
<b>Sex</b>					
Boys	136 (29.4%)	249 (53.9%)	54 (11.7%)	23 (04.9%)	462
Girls	71 (21.5%)	198 (60.0%)	41 (12.4%)	20 (06.0%)	330
<b>Category of school</b>					
Government	46 (17.2%)	175 (65.3%)	28 (10.4%)	19 (07.0%)	268
Private aided	121 (37.7%)	141 (43.9%)	41 (12.8%)	18 (05.6%)	321
Private unaided	21 (10.3%)	131 (64.5%)	28 (13.8%)	23 (11.3%)	203

The combined prevalence of overweight and obesity is 19.2%. The prevalence of overweight alone is 12.4% and whereas obesity is 6.8%. The prevalence of overweight/obesity increases with the age and is found to be high in the age group 15 yrs. The prevalence is high among girls (18.5%) compared to boys (16.6%) but it is not statistically significant (chi test,  $p = 0.05$ ). Based on category of school, the prevalence is high among private unaided school students (25.2%) compared to private aided (18.4%) and government school (17.4%) students.

## Discussion

The present study revealed that the combined prevalence of overweight and obesity is 19.2%. Comparing the results of this study with other studies in India revealed that the prevalence of overweight is consistent with other studies whereas the prevalence of obesity is high<sup>16</sup>.

The prevalence study of obesity among adolescents in public schools of Ludhiana, catering to the affluent segment of population, showed that 12.7% adolescents were overweight and 3.4% were Obese<sup>7</sup>. Another study carried out in Amritsar district of Punjab found that the prevalence of overweight is 10.94% and obesity 5.62%<sup>8</sup>. The high prevalence of overweight/obesity in adolescent is important because obese adolescents become obese adults thus increasing the risk of various diseases. This has been proved in many other studies in the past and is being researched even today to find the exact etiology.

In this study, it is also observed that the prevalence increases as the age increases. The prevalence peaked at 13, 14 and 15yrs. A school based study in Chennai done in adolescents showed that the prevalence peaked at 10, 13 and 15 years<sup>9</sup> but whereas a study in Delhi showed that the maximum prevalence of obesity was at 10-12 years<sup>10</sup>. It has been found that prevalence in higher ages of adolescents is reflective of overweight/obesity in adulthood<sup>11</sup>.

Study subjects included were boys and girls, girls showed a higher prevalence of obesity than boys. Similarly study conducted in Punjab also revealed that overweight was high among girls compared to boys

## Conclusion

There is increased prevalence of overweight/obesity among adolescents and many factors associated with it are modifiable.

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