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A study of body mass index between private and government school children

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Abstract
Body Mass Index is an easily accessible and viable tool for assessing obesity. This study investigated the difference in Body mass index (BMI) between Private and Government school children. A total of 150 school children (age 13-17) were selected for the study out of which 75 were from private schools and 75 were from government schools. Body Mass Index (BMI) was calculated by dividing weight in kilograms by height in meters squared for all the students. Independent t test shown that private school students BMI (29.31+3.72) is significantly higher than Government school students BMI (21.12+5.07).

Keywords: Body Mass Index.

1. Introduction
The body mass index (BMI) or Quetelet index is a value derived from the mass (weight) and height of an individual. The BMI is defined as the body mass divided by the square of the body height, and is universally expressed in units of kg/m^2, resulting from mass in kilograms and height in metres. The BMI may also be determined using a table or chart which displays BMI as a function of mass and height using contour lines or colours for different BMI categories, and may use two different units of measurement.

The BMI is an attempt to quantify the amount of tissue mass (muscle, fat, and bone) in an individual, and then categorize that person as underweight, normal weight, overweight, or obese based on that value. However, there is some debate about where on the BMI scale the dividing lines between categories should be placed. Commonly accepted BMI ranges are underweight: under 18.5, normal weight: 18.5 to 25, overweight: 25 to 30, obese: over 30.

BMI is a person's weight in kilograms divided by the square of height in meters. BMI does not measure body fat directly, but research has shown that BMI is moderately correlated with more direct measures of body fat obtained from skin fold thickness measurements, bioelectrical impedance, densitometry (underwater weighing), dual energy x-ray absorptiometry (DXA) and other methods. Furthermore, BMI appears to be as strongly correlated with various metabolic and disease outcome as are these more direct measures of body fatness. In general, BMI is an inexpensive and easy-to-perform method of screening for weight category, for example underweight, normal or healthy weight, overweight, and obesity.

A high BMI can be an indicator of high body fatness. BMI can be used as a screening tool but is not diagnostic of the body fatness or health of an individual.

To determine if a high BMI is a health risk, a healthcare provider would need to perform further assessments. These assessments might include skin fold thickness measurements, evaluations of diet, physical activity, family history, and other appropriate health screenings.

The prevalence of adult BMI greater than or equal to 30 kg/m^2 (obese status) has greatly increased since the 1970s. Recently, however, this trend has levelled off, except for older women. Obesity has continued to increase in adult women who are age 60 years and older.

BMI can be used for population assessment of overweight and obesity. Because calculation requires only height and weight, it is inexpensive and easy to use for clinicians and for the general public. BMI can be used as a screening tool for body fatness but is not diagnostic.

Other methods to measure body fatness include skin fold thickness measurements (with calipers), underwater weighing, bioelectrical impedance, dual-energy x-ray absorptiometry (DXA), and isotope dilution. However, these methods are not always readily available, and

they are either expensive or need to be conducted by highly trained personnel. Furthermore, many of these methods can be difficult to standardize across observers or machines, complicating comparisons across studies and time periods.

BMI is interpreted differently for children and teens, even though it is calculated using the same formula as adult BMI. Children and teen's BMI need to be age and sex-specific because the amount of body fat changes with age and the amount of body fat differs between girls and boys. The CDC BMI-for-age growth charts take into account these differences and visually show BMI as a percentile ranking. These percentiles were determined using representative data of the U.S. population of 2- to 19-year-olds that was collected in various surveys from 1963-65 to 1988-94.

Obesity among 2- to 19-year-olds is defined as a BMI at or above the 95th percentile of children of the same age and sex in this 1963 to 1994 reference population. For example, a 10-year-old boy of average height (56 inches) who weighs 102 pounds would have a BMI of 22.9 kg/m^2. This would place the boy in the 95th percentile for BMI - meaning that his BMI is greater than that of 95% of similarly aged boys in this reference population - and he would be considered to have obesity.

2. Methodology

The participants of the study were 150 school students aged 13-17. Out of which 75 were private school students and 75 Were government school students. Intact groups were selected For Private schools and for Government schools; students from district Rewari, (Haryana) Howrah were a part of the study.

All the students were male. Body Mass Index (BMI) was calculated by dividing weight in kilograms by height in meters squared. Descriptive statistics and graphical depiction was calculated for Government and private schools. Independent Samples T-Test was conducted to analyze significance mean difference in BMI between Private and Government school students.

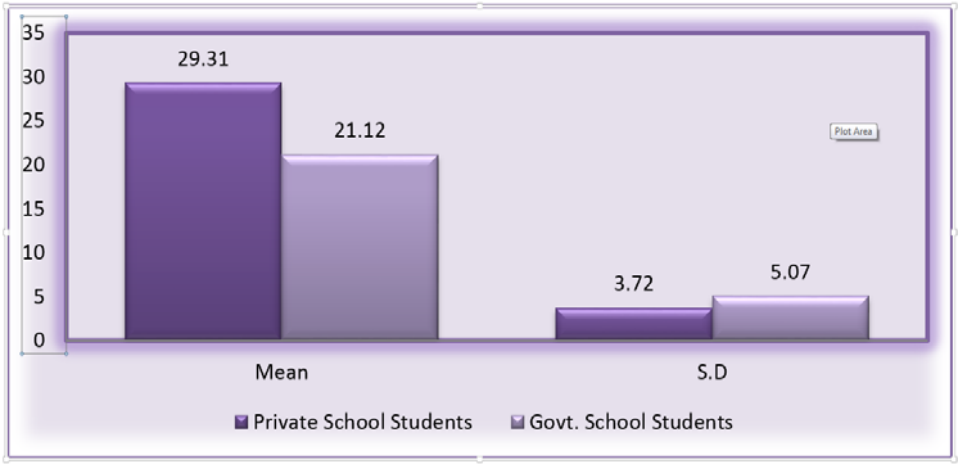
3. Results

Data was collected and analysed in order to draw a conclusion about Body Mass Index of Private and Government school children, and the scores are given bellow.

Table 1: Mean and Standard deviation of BMI scores of Children from Government and Private schools

Variables	Mean	S.D
Private School Students	29.31	3.72
Govt. School Students	21.12	5.07

The mean and Standard Deviation of the two groups of Private and Government school children has been presented in Table 1. The mean BMI scores of Private and Government school children have been represented graphically in Graph no 1.



Independent sample t-test was conducted to analyse the significance of mean difference between Private and Government school children's BMI scores. Results which are shown in Table 2 are the results of independent t-test conducted between BMI scores of Private and Government schools students.

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Table 2: Independent Samples T-Test for the means of BMI of Private and Government school students

Variables	t	Sig. 2 tailed	Mean Difference
Private School Students	15.93	0.00	8.19
Govt. School Students	13.59	0.00	8.19

Significance level of 0.05

Results of Independent samples t-tests have been shown in Table 2. The independent t test has shown a significant difference in BMI between Private and Government school children, as the calculated t value is 21.179 is greater than the tabulated t value is 1.96 is at 0.05 level of significance.

4. Discussion

The purpose of the study was to compare school children from Private and Government schools on Body mass index. As, we know that physical activities has lost its importance in the daily life of school children, it is needed to investigate the status of BMI in Indian school children.

The children from private and Government schools have different level of economic status and lifestyle patterns. Family members and parents of the children also have different amount of expectations from their kids. So, all these factors and many other factors collectively influence in physical activity behaviour. In India, being a part of private school or a government school is a matter of privilege caused by socio-economic status. Our study aimed to analyze BMI of Private and Government school children.

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