



## Assessment of the dietary patterns among school going children with age-group (9 years -15years) – A gender comparison

### KEYWORDS

Childhood Obesity; obese; anthropometry; dietary nutrient intake;

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**ABSTRACT** *Childhood obesity is one of the most serious public health challenges of the 21st century. This study involved 132 subjects between the age group of 9 to 15 years and their dietary nutrient intake, anthropometry measurement, and food consumption pattern was studied. These parameters were then correlated to body composition. Their dietary nutrient intake showed that energy intake was inadequate, followed by high consumption of carbohydrates and fat and the protein intake was lowest on comparison with RDA. Their anthropometry revealed that most of the subjects were below normal standards as compared to CDC and WHO standards. Their food consumption was monitored it was seen that there was higher consumption of junk food and beverages in their diet. Thus when these parameters were compared it was observed that dietary nutrient intake and anthropometry had a positive correlation with body composition*

### Introduction

Childhood obesity is one of the most serious public health challenges of the 21st century.

The problem is global and is steadily affecting many low and middle-income countries, particularly in urban settings. The prevalence has increased at an alarming rate. Globally, in 2010 the number of overweight children under the age of five is estimated to be over 42 million. Close to 35 million of these are living in developing countries.

Armstrong et.al, in 2003 stated under nutrition and obesity as significantly more common as expected in young children and strongly associated with social deprivation. Both under nutrition and obesity have adverse short and long term health effect.

Obesity is a complex condition with serious social and psychological dimensions, virtually affecting all age groups threatening to overwhelm both developed and developing countries as stated by the World Health Organization. In 1995, WHO estimated 200 million obese adults and 18 million children under the age group of five were classified as overweight. The number increasing to 300 million obese adults in the year 2000. As per WHO obesity epidemic is not only restricted to industrialized society but also showing an estimation of over 115 million people suffering from obesity related problems in developing countries. ([www.who.int](http://www.who.int))

Anthropometry provides the single most portable, universally applicable, inexpensive and non-invasive technique for assessing the size, proportions, and composition of the human body. It reflects both health and nutritional status and predicts performance, health, and survival. As such, it is a valuable, but currently underused, tool for guiding public health policy and clinical decisions. (World Health Organization 2005)

Body Mass Index (BMI) is a number calculated from a child's weight and height. BMI is a reliable indicator of body fatness for most children and teens. BMI does not measure body fat directly, but research has shown that BMI correlates to direct measures of body fat, such as underwater weighing and dual energy x-ray absorptiometry (DXA).

BMI can be considered an alternative for direct Measures of body fat. Additionally, BMI is an inexpensive and easy-to-perform method of screening for weight categories that may lead to health problems. Use of BMI for assessment of current nutritional status in Indian children is essential in all settings where length / height measurements are possible because (i) early detection of current energy inadequacy leading to low BMI and intervention to correct it can prevent stunting; this is critical because stunting cannot be reversed; (ii) majority of Indian stunted children have appropriate weight for their height and age (normal BMI/age); increase energy intake may make them prone to over nutrition; and (iii) under nutrition in early childhood followed by rapid increase in body mass index in early/ late childhood/ adolescence may predispose to over nutrition and non communicable disease risk in early adult life<sup>28</sup>.

### Eating pattern and nutritional status:

Eating habits refers to what food we eat, how we eat it and why we eat it. Eating habits are influenced by social, cultural, religious, economic and environmental factors. Basically, all people eat to stay alive, but they also eat to show belonging to family or other social groups. Eating food is a part of everyone's life and having small structured meals throughout the day is an essential part as it helps in maintaining the body weight and prevent from any kind of overweight issues. Economic factors such as the availability of food and its cost also affect food choices. Food labelling also influences what food we choose. Advertising and media are also factors that may alter eating habits. While excessive publicising on certain foods such as biscuits and chocolate may boost sales, they may also worsen eating habits of youngsters having them pick a sugary or salty snack over an apple or an aerated drink over mineral water. This was the major factor that played a role in how the normal eating habits was modified by the current trends' that embark a person's life and hence it was very important to keep in mind that the propaganda created in the food sector was not the ultimate source of food. Nutritional status is the level of nutrition that the person holds after consumption of food and how that nutrition affects the eating choices of the person.

**Objectives of the study were,**

- To study factors affecting childhood obesity.
- To assess the anthropometry of the subjects.
- To investigate the body composition.
- To determine the dietary status of the subjects.

**Methodology:**

The study was conducted in IES NAVI MUMBAI VASHI school children in the age group of 9-15 years. Total 132 subjects were taken for the study out of which 64 were male and 68 were female subjects. The inclusion criteria for subjects were clinically healthy students from school. Subjects with any disease condition were in exclusion criteria of my study. After the categorization of the subjects into two groups of male and female subjects their anthropometric measurement were collected and calculated (Height, Weight, BMI, WHR) using standard method and standard weighing scale and measuring tape.

Other aspects were to assess their daily dietary intake through the 24hr Diet Recall and Food Frequency Questionnaire.

**BMI CLASSIFICATION:**

Weight Status Category	Percentile Range
Under Weight	Less than 5 <sup>th</sup> percentile
Healthy Weight	5 <sup>th</sup> percentile to less than 85 <sup>th</sup> percentile
Over Weight	85 <sup>th</sup> to less than 95 <sup>th</sup> percentile
Obese	Equal to or Greater than 95 <sup>th</sup> percentile

Source: Center For Disease control And Prevention (2011)

**Results and Discussion:**

Age group: (9 years )

**Table 4.1.a: Height, Weight, BMI, Waist, Hip, and WHR patterns amongst male and female subjects**

	Gender	N	Mean	Std. Deviation	Sig( 2-Tailed)
<b>Height</b>	Male	24	132.08	5.69	0.30
	female	29	133.83	6.44	
<b>Weight</b>	Male	24	26.59	6.11	0.55
	female	29	30.52	8.05	
<b>BMI</b>	Male	24	15.45	3.38	0.14
	female	29	17.01	4.18	
<b>Waist</b>	Male	24	54.02	13.54	0.47
	female	29	56.76	13.68	
<b>Hip</b>	Male	24	61	14.78	0.22
	female	29	66.19	15.84	
<b>WHR</b>	Male	24	0.88	0.03	0.27

**Table 3: the mean nutrient intake of the samples (Age group 10and9 years)**

Nutrient	10 years sub-jects					9 years sub-jects				
	Gender	N	Mean	Std.Devia-tion	Sig. (2-tailed)	Gender	N	Mean	Std.Devia-tion	Sig. (2-tailed)
<b>Energy</b>	Male	39	1646.13	551.72	0.65	Male	24	1542.29	598.33	0.66
	female	35	1597.34	508.47		female	29	1613.72	590.09	
<b>Carbo-hy-drate</b>	Male	39	268.87	70.12	0.61	Male	24	277.33	81.88	0.44
	female	35	260.71	69.95		female	29	260.21	74.19	
<b>protein</b>	Male	39	27.31	8.26	0.04	Male	24	26.50	11.17	0.90
	female	35	23.34	8.35		female	29	26.83	9.15	

	female	29	0.85	0.05	
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**Table 4.2: Height, Weight, BMI, Waist, Hip, and WHR patterns amongst male and female subjects (Age group 10 years).**

	Gender	N	Mean	Std. Deviation	Sig( 2-Tailed)
<b>Height</b>	Male	39	133.04	6.39	0.36
	female	35	134.37	6.21	
<b>Weight</b>	Male	39	30.46	7.20	0.55
	female	35	29.38	8.29	
<b>BMI</b>	Male	39	17.10	3.37	0.28
	female	35	16.16	3.86	
<b>Waist</b>	Male	39	58.92	12.30	0.13
	female	35	54.91	10.05	
<b>Hip</b>	Male	39	66.36	14.12	0.83
	female	35	65.76	10.42	
<b>WHR</b>	Male	39	0.88	0.41	0.00
	female	35	0.75	0.55	

Comparison between male and female subjects according to their heights, weights, BMI, dietary intake and meal time habit was drawn. According to their height the result showed that there was a very minimal differences in height of the both the subjects, whereas there was no significant difference in the weight. Weight of female subjects was significantly higher than that of male subjects. According to their BMI, the result showed that there was a no significant difference between male and female subjects male subjects showed higher BMI than female subjects. From the data the subjects were categorized according to BMI classification that is underweight, healthy weight, overweight and obese .it was observed that the percentage of underweight was higher in both the gender than the overweight and obese children .whereas half of the population found healthy.

fat	Male	39	26.08	7.91	0.24	Male	24	23.88	8.35	0.59
	female	35	23.89	8.20		female	29	25.14	8.81	

Dietary intake when compared with the RDA range it was observed that female had higher inadequacy of energy and carbohydrate consumption than the male subjects. Whereas the protein and fat intake was inadequate as recommended by RDA, only a marginal difference was seen between both the genders.

#### CONCLUSION:

The anthropometric measurements demonstrated the weight and height of the subjects less than the normal ranges and on classifying the BMI it was observed that 51% of population was in the normal range. The waist and hip measurement were found to be lower than the normal ICMR range.

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In the study it was observed that the nutrient intake of protein was less than required. Similarly energy requirement were low but the fat and carbohydrate intake in the diet were higher. On comparing the nutrient intake and body composition there was a significant correlation observed as  $P < 0.01$ .

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