



## STUDY OF OBESITY AND OVERWEIGHT IN CHILDREN

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Obesity and overweight is a rapidly growing threat to the health of the society. Obesity is a single marker of the child at risk for development of various non-communicable diseases later in life, it has been called "New World Syndrome". **AIMS AND OBJECTIVES:** To study common risk factor for obesity and prevalence of obesity and its relation to socioeconomic status. **METHODS:** It is a cross sectional study including all the present children between 9 to 12 years of age. Case control study for the risk factors of obesity. Two school one private and one municipal corporation were selected in Ahmedabad city. Total 1364 students were present on the day of survey. NCHS guidelines were used. **DISCUSSION:** Prevalence of overweight is 8.57% and obesity is 4.98%. Most common risk factor includes sedentary life style, high fat and energy dense food, urbanization. **CONCLUSION:** Total prevalence of the obesity is 13.55% as mentioned previously. Prevalence of obesity is higher in private than in municipal school which suggest children of higher socio economic status are more prone to develop obesity.

**KEYWORDS :** Obesity and overweight, sedentary life style, high calorie consumption.

**INTRODUCTION**

Obesity is defined as a condition of abnormal and excessive fat accumulation in adipose tissue to the extent that health may be impaired. Obesity and overweight is a rapidly growing threat to the health of the society. World Health Organization describes an epidemic of obesity affecting at least 300 million people. In 2000, the world-wide number of obese people exceeded the number of underweight people. Obesity is a single marker of the child at risk for development of various non-communicable diseases later in life like Coronary heart disease, hypertension, stroke, cancer, diabetes, dyslipidemia, osteoarthritis, pulmonary diseases, etc. In addition, the obese suffer from social bias, prejudice and discrimination on the part, not only of the general public but also of the health professionals and this may make them reluctant to seek medical assistance.

**CAUSES OF CHILDHOOD OBESITY AND OVERWEIGHT**

1. Genetic/Familial
2. Environmental: Increased calorie intake, TV viewing, Video games.
3. Endocrine: Hypothyroidism, Cushing syndrome, hyperinsulinism, growth hormone deficiency, etc.
4. CNS lesion: Infection, Trauma, Surgery, Irradiation.
5. Drugs: Steroids, Antipsychotic medication, Antidepressant drugs, Mood stabilizers, Anticonvulsants, Anti diabetics.
6. Miscellaneous: Leptin deficiency and MC4R deficiency.

**COMPLICATIONS OF OBESITY**

1. Cardiovascular: Coronary heart disease, Hypertension, Dyslipidemia, Left ventricular hypertrophy, Pulmonary hypertension, Increased thrombotic state.
  2. Gastrointestinal: Gastro esophageal reflux disease, Reflux esophagitis, Non alcoholic fatty liver disease, Cholelithiasis, Hernias.
  3. Neurological: Stroke, Pseudo tumor cerebri.
  4. Respiratory: Obstructive sleep apnoea, Dyspnoea and fatigue, Asthma, Restrictive lung disease.
  5. Endocrine: Insulin resistance type 2 diabetes, Polycystic ovarian syndrome, Amenorrhoea.
  6. Musculoskeletal: Degenerative arthritis, Low back pain, Flat feet, Blount's disease.
  7. Psychological: Depression, Bipolar disorder, Behavior abnormalities.
  8. Genitourinary: Urinary stress incontinence.
  9. Cancers: Endocrine, Gall bladder, Hepatic, Pancreatic, etc.
- Other complications like cellulitis, intertrigo, carbuncles can occur. Also childhood obesity is known to persistent in

adulthood in some cases.

Management therapies includes,

1. Behavior therapy: Self monitoring, stimulus control, cognitive restructuring.
2. Pharmacotherapy: Medications reducing energy intake (Fenfluramine, Phentermine, Sibutramine), Medications reducing absorption of nutrients (Orlistat), Miscellaneous (Leptin, Octreotide, Metformin)
3. Bariatric surgery: Malabsorptive procedures, Restrictive procedures.

**AIMS AND OBJECTIVES**

- To study the prevalence of the overweight and obesity in school going children in 2 schools of Ahmedabad city.
- To study common risk factors for overweight and obesity.

**MATERIALS AND METHODS**

Data regarding the list of schools in Ahmedabad was collected from Deputy Director of public instruction office. Two schools were selected based on simple random sampling method and cross sectional study was conducted after official permission from schools.

**STUDY TYPE:** Cross sectional study for the prevalence of obesity. Case control study for the risk factor of obesity.

**INCLUSION CRITERIA:** Children between age group of 9 to 12 years present in the school on the day of survey.

**EXCLUSION CRITERIA:** Children diagnosed to be obese due to endogenous causes on clinical examination.

The age of children was obtained from the school records. The weight was recorded using bathroom scale calibrated to 500 gm accuracy and height was measured using stadiometer with an accuracy of 0.5 cm. BMI was calculated [wt(kg)/ht(meter)<sup>2</sup>].



To study risk factors 100 obese and 100 normal children were selected randomly. A designed proforma was given to each student to fill up the dietary details by recall of last 24 hours. Criteria used for obesity and overweight, According to NCHS guidelines as mentioned in Table 1.

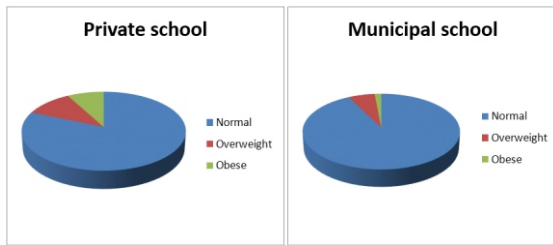
**Table.1.**

CATEGORY	BMI
Normal or Underweight	<85 <sup>th</sup> percentile
Overweight	85 <sup>th</sup> – 95 <sup>th</sup> percentile
Obese	>95 <sup>th</sup> percentile

**OBSERVATION AND DISCUSSION**

**Table.2.** SCHOOL WISE DISTRIBUTION OF OBESITY AND OVERWEIGHT

	TOTAL	OVERWEIGHT	OBESE	NORMAL
Private school	724	78 (10.7%)	58 (8%)	588 (81.3%)
Municipal school	640	39 (6%)	10 (1.5%)	591 (92.5%)
Total	1364	117 (8.57%)	68 (4.98%)	1179 (86.5%)



In private school 10.7% children were overweight and 8% children were obese compared to municipal school in which 6% were overweight and 1.5% were obese. So it is concluded that proportion of overweight and obesity is higher in children of private school compared to municipal school showing that obesity is more prevalent in upper socioeconomic class.

**Table.3.** Excess calorie intake and average screen viewing in cases and control.

	Excess calorie intake Kcal/day	Average screen viewing time Hours/day
Cases	+40.78	4.68
Controls	-74.27	2
T value	6.84	29.62
Significance	<0.001	<0.001

Average excess calories per child per day in cases were 40.78% Kcal. more than RDA for this age group as compared to -74.27% Kcal. less than RDA for this age group in controls.

Average hours of television viewing in cases were 4.68 hours as compared to 2.00 hours in controls. On an average, an obese child watched TV 2.3 times more than non-obese child.

The children from private school ate more junk food (outside food including cold drinks, ice candies, etc.) than that from other school.

The results in excess calorie intake and TV viewing time both are significant in cases compared to control in this study carried out in Ahmedabad in age group 9-12 years.

**Table.4.** Prevalence of obesity in various studies

Study	Age group (years)	Total	Overweight	Obese
Khadilkar et al Pune	10-15	1228	19.9%	5.7%

Subramanyam et al, Chennai	10-15	610	9.67%	6.23%
M Shashi et al, 2010 Karnataka	12-15	900	9.4%	4.8%
T.Aggrawal et al, 2008,Ludhiana	10-19	1000	12.7%	3.4%
Present study Ahmedabad	9-12	1364	8.5%	4.9%

The prevalence of obesity varies from 3.4% to 6.23% in different parts of world. Indeed, obesity and overweight are now so common that they are replacing the traditional problems such as under nutrition and infectious diseases as the most significant causes of ill health. Prevalence of overweight is higher than obesity in all places. The prevalence of obesity varies widely in different cities making its distribution unequal.

**CONCLUSION**

Childhood obesity is in increasing trend from past 20 years in both developing and developed countries.

In present study,

- The prevalence of childhood obesity (both overweight and obese) in school children in Ahmedabad city between 9 to 12 years is 13.55%. Of which, overweight and obese are 8.5% and 4.9% respectively.
- Prevalence of overweight and obesity is significantly higher in private(18.7%) than municipal school(7.5%) showing that obesity is more prevalent in upper socioeconomic class in Ahmedabad city.
- Risk factor for childhood obesity like high calorie intake, increased sedentary behavior has been confirmed in the present study, being significantly higher in obese children compared to the normal children in this case control study where 100 obese and 100 normal children were taken as case and controls respectively.

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