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## A study on children's obesity and overweight at Srikakulam: North coastal region of Andhra Pradesh

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### Abstract

Frequency of obesity is rising day by day because of various factors. It is important to assess the trend of obesity in particular geographical area. Objective: To evaluate the incidence and common risk factor of obesity and overweight in children related to socioeconomic status. Methods: The cross sectional observational study for the incidence and to study the risk factors of obesity was done in two schools of Srikakulam municipal area during May 2018 to December 2018. Two schools were chosen based on simple random sampling method. Children between age group of 9 to 12 years present in the school on the day of survey were included in the study. Children diagnosed to be obese due to endogenous causes on clinical examination were excluded NCHS guidelines were used. Results: Incidence of obesity and overweight between the study subjects was 5% and 7.6%. The incidence of obesity is 7.5% in affluent school and 2.1% in municipal school respectively. Conclusion: There is significant incidence of obesity in private school children compared with municipal school in Srikakulam, India.

**Keywords:** Obesity, overweight, affluent incidence, pediatrics

### Introduction

There has been a global raise in the frequency of obesity between the common paediatric populations obesity is clear as a state of irregular and unnecessary fat accumulation in adipose tissue to the extent that health may be impaired. Obesity and overweight is a hastily increasing risk to the fitness of the society<sup>[1]</sup>. Infancy obesity is related with a number of health problems, counting hypertension, diabetes, sleep-disordered breathing, a variety of orthopaedic complications and abnormal lipid profiles, as well as stigmatization and harassment<sup>[2]</sup> 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<sup>[3]</sup>. The maximum occurrence rates of childhood obesity have been observed in urban countries; Though, its incidence is growing in developing countries as well fatness is a main sign of the child at threat for growth of different non-communicable diseases later on in existence it may leads to CVD, hypertension, stroke, pulmonary disorders, cancer, diabetes, dyslipidemia, osteoarthritis, etc.<sup>[4]</sup> In addition, the overweight suffer from social bias, discrimination and favoritism on the part, not only of the common people but also of the health professionals and this may build them unwilling to seek medical support.

### Causes of children's overweight

It is usually conventional that raise in obesity outcome from a difference between energy intake and expenses, with an raise in optimistic energy balance being intimately related with the way of life adopted and the nutritional intake preferences. On the other hand, there is upward confirmation indicating that a person's genetic environment is significant in influential obesity possibility. Research has made important contributions to our understanding of the factors associated with obesity<sup>[5]</sup>. The child risk factors for fatness comprise Genetic / Familial diet which contain high calorie intake, No physical activity, TV viewing, Video games. Endocrine causes of Hypothyroidism, Cushing syndrome, hyperinsulinism, growth hormone deficiency, etc. other risk factors like CNS lesion causes Infection, Trauma, Surgery, Irradiation<sup>[6]</sup>. Using of drugs like Steroids, Antipsychotic medication, Antidepressant drugs, Mood stabilizers, Anticonvulsants, Anti diabetics. And other various causes like Leptin deficiency and MC4R deficiency and inactive performance<sup>[6]</sup>. The impact of such risk factors is moderated by factors such as age, gender. Family socio economic status of the parent's individuality parenting approach to the children and

Parents' lifestyles also play a key role in activity behavior.

**Complications of obesity**

Cardiovascular complications like Coronary heart disease, Hypertension, Dyslipidemia, Left ventricular hypertrophy, pulmonary hypertension, and increased thrombotic state [8].

Psychological complications like Depression, Bipolar disorder, Behavior abnormalities [9].

Neurological complications like Stroke, Pseudo tumor cerebri. Respiratory problems like Obstructive sleep apnoea, Dyspnoea and fatigue, Asthma, Restrictive lung disease [10].

Endocrine complications are Insulin resistance type 2 diabetes, polycystic ovarian syndrome, Amenorrhea [11].

Gastrointestinal: Gastro esophageal reflux disease, Reflux esophagitis, Nonalcoholic fatty liver disease, Cholelithiasis, Hernias. Genitourinary: Urinary stress incontinence.

Cancers: Endocrine, Gall bladder, Hepatic, Pancreatic, etc [12].

Other complications like Musculoskeletal: Degenerative arthritis, Low back pain, Flat feet, Blount's disease, cellulitis, intertrigo, carbuncles can occur. Also childhood obesity is known to persistant in adulthood in some cases [13].

Management therapies includes,

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

**Aim & Objective**

To study the incidence of the overweight and obesity, and to

study common risk factors for overweight and obesity in school going children in two schools at Srikakulam.

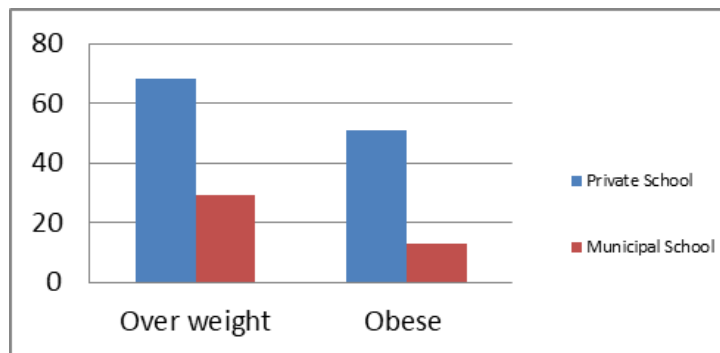
**Materials and Methods**

The cross sectional observational study for the incidence and to study the risk factors of obesity was done in two schools of Srikakulam municipal area during May 2018 to December 2018. Two schools were chosen based on simple random sampling method. Children between age group of 9 to 12 years present in the school on the day of survey were included in the study. Children diagnosed to be obese due to endogenous causes on clinical examination were excluded.

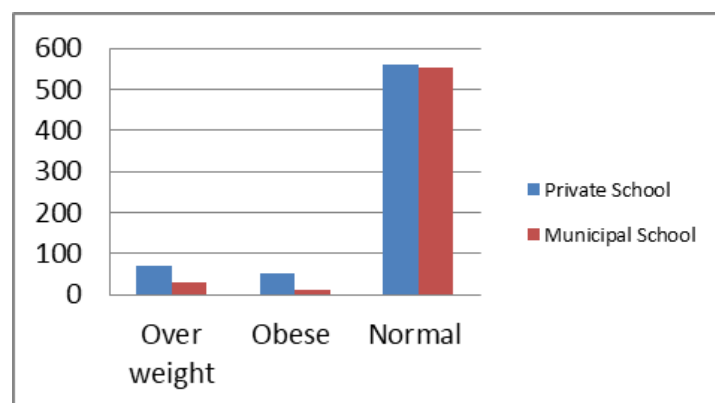
The age of children was obtained from the school report. The weight was recorded using bathroom scale calibrated to 500 gm accuracy and height was measured using stadiometer with an accuracy of 0.5 cm. BMI was calculated [wt (kg)/ht (meter)<sup>2</sup>]. To study risk factors 100 obese and 100 normal 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 was Normal or Underweight was >85<sup>th</sup> percentile, Over weight was considered at 85<sup>th</sup> to 95<sup>th</sup> percentile and where as obese was <95<sup>th</sup> percentile.

**Results and Discussion**

In private school 10% children were overweight, 7.5% children were obese and 82.5% were normal children compared to municipal school in which 4.8% were overweight, 2.1% were obese and 92.9% were normal children which were shown in Table1 and Figure1&2. So it is clearly indicated that the percentage of overweight and obesity is higher in children of private school compared to municipal school showing that obesity is more common in upper socioeconomic class.



**Fig 1:** Comparison of over wight and obesity



**Fig 2:** School wise weight distribution

**Table 1:** School wise allocation of obesity and overweight

Groups	Total	Over weight	Obese	Normal
Private School	680	68 (10%)	51 (7.5%)	561 (82.5%)
Municipal School	596	29 (4.8%)	13 (2.1%)	554(92.9%)
Total	1276 (100%)	97 (7.6%)	64 (5%)	1115 (87.3%)

**Table 2:** Excess calorie intake and average television watching in cases and control

Groups	Excess Calorie intake (Kcal/Day)	Average screen viewing time (Hours/Day)
Cases	+41.01	5.1
Controls	-73.87	1.95
T Value	6.78 <0.001	28.59 <0.001

Obesity is a worldwide dietary worry. The incidence of obesity is elevated in developed countries and related trends are being experiential in current years between children from developing countries [2, 3]. School based data on obesity in India shows a incidence of 5.6-24% among children and adolescents [14]. The huge range in the reported incidence of obesity and overweight might be due to local differences, non-uniformity in the criteria used to categorize socio economic status and, the different age range of the children studied. In the present study, the incidence of obesity was 5% and overweight was 7.6% Marwah P 2012' [14] reported a 7.6% incidence of obesity in affluent school children in Punjab. Kaur S *et.al.*, 2008' [15] the incidence of obesity and overweight in Low, middle and High Income Group school children was 0.1 and 2.7 % 0.6 and 6.5% and 6.8 and 15.3% respectively in Delhi. In our study Average excess calories per child per day in cases (Obesity and overweight children) were 41.01% Kcal, more than RDA for this age group as compared to -73.87% Kcal. Less than RDA for this age group in controls (Normal children) shown in table2. And other most important reasons of obesity in children is watching TV or using computers. In our study average hours of television watching in cases were 5.1 hours as compared to 1.95 hours in controls. On an average, an obese child watched TV 2.8 times more than non-obese child. Physical inactivity has not lone a main part in the progress of obesity and overweight, but also in the growth of chronic diseases such as CVD, hypertension, diabetes, and cancer in later life. Eating out side junk food has turn out to be a drift in these days, the children from private school ate more junk food (Outside food including cold drinks, ice candies, etc.) than that from other school. The outcome in excess calorie intake and TV watching time both are important in cases compared to control in this study which was carried out at Srikakulam in age group of 9-12 years. The incidence of obesity varies from 3.4% to 6.23% in different parts of India Indeed [14, 15]; obesity and overweight are now so common that they are replacing the conventional problems such as under nutrition and communicable diseases as the most important causes of ill health. Incidence of overweight is higher than obesity in all places. The incidence of obesity varies extensively in different areas making its allocation imbalanced.

### Conclusion

The incidence of childhood overweight & obesity in school children among 9 to 12 years was 12.6%. Of which, overweight and obese are 7.6% and 5 % respectively. Frequency of overweight and obesity is extensively higher in private (17.5%) than municipal school (6.9%) presenting that obesity is more ubiquitous in upper socioeconomic class in Srikakulam. Thus, we conclude that the low levels

of physical activity, high calorie intake/ eating junk food, high television watching time are major risk factors in causation of childhood obesity in Srikakulam and propose an urgent requirement to instruct town community on aspects of healthy food habits and preferred lifestyle to avoid the obesity and overweight in childhood.

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