

# Research in Pharmacy and Health Sciences

## Research Article

### Prevalence of Obesity and Overweight among Adolescent School Children in Jaipur, India

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#### ABSTRACT

**Objective:** The potential public health problem that is emerging now a days is an increasing incidence of childhood obesity and overweight in developing countries. It lead to a number of health related problems among children. This study was carried out to study the prevalence of obesity and overweight among adolescent school children of Achrol, Jaipur. Moreover, this study was also to identify any differences as per age, gender, life style disorders and diet preference. **Setting and design:** It was a school based cross-sectional study carried out over a period of 2 months in three different schools of Achrol village. **Materials and methods:** Adolescent school children between 12 to 15 years of age were analyzed by a random sampling procedure in three different selected schools. **Results:** The overall prevalence of obesity was 2% and of overweight was 10.2% among adolescent school children. The prevalence of overweight was 9.5% among boys and 10.9% among girls indicating that girls were at a greater risk of becoming obese. **Conclusion:** Overweight was marginally higher in the pubertal age groups of 13 to 15 years in Achrol and timely intervention is required for its control.

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#### INTRODUCTION:

Overweight in children is an antecedent of adult obesity. Therefore, the need to estimate overweight in children has been recognized as a step towards identifying high risk groups and to evolve preventive strategies for diseases associated with overweight by several countries. Overweight is a major problem in many developed countries and is an important risk factor for many diseases including diabetes and cardiovascular diseases (CVD) [1]. There are only meager data available from India.

Obesity is an independent risk factor for CVD. Obesity is associated with an increased risk of morbidity and mortality as well as reduced life expectancy. The last two decades of the previous century have witnessed dramatic increase in health care costs due to obesity and related issues among children and adolescents. For children and adolescents, overweight and obesity are defined using age and sex specific normograms for body mass index (BMI). Children with BMI equal to or exceeding the age-gender-specific 95<sup>th</sup> percentile are defined obese. Those with BMI equal to or exceeding the 85<sup>th</sup> but are below 95<sup>th</sup> percentiles are defined overweight and are at risk for obesity related co-morbidities [2].

Diet and lifestyle are ostensibly major contributors to weight problems and varies with different SES especially countries like India. Overweight and obesity are strongly associated with certain types of diets, such as those that include large amounts of fats, animal-based foods and processed foodstuffs. Sedentary lifestyles are also an important factor, including spending no time for outdoor sports and participating in little or no physical activity during leisure time [3]. It has been

reported that population prevalence of overweight increased by 60–70%, obesity increased 2–4-fold during 1985–1997 in Australia. In British children from 1989 to 1998 there was a highly significant increasing trend in the proportion of overweight children (14.7% to 23.6%;) and obese children (5.4% to 9.2%;), the prevalence of child obesity and overweight has doubled in North America during the past two decades and in Thailand, the prevalence of obesity in schoolchildren has increased from 12% in 1991 to 16% in 1993. However, few studies have examined the worldwide situation regarding childhood obesity, particularly due to the fact that no standard or reference is agreed upon internationally. Different definitions have been used in studies to define childhood obesity and overweight. There has been a lack of consensus over the definitions, the current lack of consistency and agreement between different studies over the classification of obesity and overweight in children and adolescents makes it difficult to give an overview of the global prevalence of obesity and overweight. Thus, the world based standardized obesity and overweight classification system is urgently needed but now internationally based cutoff points have been published. Various contributing factors to obesity and overweight are socio-economic group, family history and diet and life style of the children [3].

A recent study conducted among 24,000 school children in south India showed that the proportion of overweight children increased from 4.94 per cent of the total students in 2003 to 6.57 per cent in 2005 demonstrating the time trend of this rapidly growing epidemic. Socio-economic trends in childhood obesity in India are also emerging. A study from

northern India reported a childhood obesity prevalence of 5.59 per cent in the higher socio-economic strata when compared to 0.42 per cent in the lower socio-economic strata [2].

The prevalence rates of obesity in 1985 including from the metropolis area, were only 0.2% and 0.1% for boys and girls, and the prevalence of overweight was between 1% and 2% indicating that was no trend of obesity epidemic then. However, a rapid increase of overweight prevalence has been noticed since the early 1990s, and the increments were more seen in the urban than in the rural areas and more in boys than in girls. In the most developed cities including Beijing, the prevalence rates of obesity appeared to be 4.7%, 3.8% and 3.2%, among three groups with higher risk: the 7 - 9, 10 - 12 year-old boys and 7 - 9 year-old girls, respectively. Both high prevalence rates of malnutrition and overweight were also found in that period. In year 1995, a large scale of increments of overweight were found both in the urban and rural groups. In the most developed metropolis, the prevalence of overweight was two to three folds more than that of 10 years ago. The prevalence of obesity was 6% - 8% for boys and 4% - 6% for girls, respectively. Since 2000, most of the Chinese metropolis had started the so called 'overall increment period' of obesity. The prevalence rates of obesity plus overweight had reached 25.4%, 25.5%, 17.0% and 14.3% for boys aged 7 - 9 years and 10 - 12 years, and girls aged 7 - 9 years and 10 - 12 years, respectively. Among them, the prevalence rates of obesity were 12.9% and 9.1% for boys aged 7 - 9 and 10 - 12 years, which had already reached the average level seen in the medium-developed countries in the world [4].

There are critical phases in the evolution of obesity. Intrauterine growth patterns play a significant role in the evolution of obesity by modifying fat and lean body mass, neuro-endocrine appetite control mechanisms, and pancreatic functional capacities. Longitudinal studies have identified a strong relationship between birth weight and BMI attained in later life. Increasing birth weight was independently and linearly associated with increasing prevalence of childhood obesity in the Avon Study. In addition, low birth weight babies show a dramatic transition to central adiposity and insulin resistance very early in life. These two factors are known to increase cardiovascular risk manifold. Catch up growth and early adiposity rebound increase the odds of children as well as adults becoming obese significant. The combination of lower birth weight and higher attained BMI is most dangerous as it is associated with extreme CVD risk in later life. The nature and duration of breastfeeding have been found to be negatively associated with risk of obesity in later childhood. A systematic review of nine studies has concluded that breastfeeding seems to have a small but consistent protective effect against obesity in children. The normal pattern of insulin resistance during early puberty may be a natural cofactor for unnecessary weight gain as well as various co-morbidities of obesity. Early menarche is clearly associated with extent of obesity, with a two-fold increase in rate of early menarche associated with BMI greater than the 85th percentile. The risk of obesity persisting into adulthood is higher among obese adolescents than among younger children [2].

#### Adverse effects of childhood obesity which may occur later in life

Organ system	Disorder/adverse effects
Cardiovascular	-early onset of atherosclerosis -left ventricular hypertrophy
Endocrine	-insulin resistance -DM -PCOS
Gastrointestinal	-gall stones -non alcoholicsteato-hepatitis
Neurological	-pseudo tumor cerebrii
Orthopedic	-tibia vera -osteoarthritis
Psychosocial	-obsessive concern over body image -expectation of rejection -low self esteem -depression
Pulmonary	-increased bronchial activity -obstructive sleep apnoea -pulmonary embolism
Renal	-increased sensitivity to sodium -proteinuria -decreased natriuresis

Keeping these factors in mind, this study was carried out to study the prevalence of obesity and overweight among adolescent school children of Achrol, Jaipur. Moreover, this study was also to identify any differences as per age, gender, life style disorders and diet preference.

#### Materials and Methods

It was a cross-sectional descriptive study. The study included 225 school students selected from three schools from a village in Achrol, Jaipur. There were 51.1% (115) boys and 48.9% (110) girls included in this study. It was carried out in August to October 2014. School authorities were requested to provide a list of children attending school from Classes 6 to 12. Informed consent were obtained from school authorities to make anthropometric measurements and also to collect data by questionnaire from the children. The questionnaire provided information on physical activity, food habits, occupation of parents and the economic status. Completed age of the children was noted. Height and weight was measured using standard procedure and BMI ( $\text{kg}/\text{m}^2$ ) was calculated. Measurements were made by trained staff.

#### Data analysis

Data were analysed by using SPSS version 17. Descriptive methods were used for data summary and presentation. Inferential methods were used for comparisons of subscale means and other types of hypothesis testing.

#### Results and Discussion

A total of 225 students (115 boys, 110 girls) were studied from 3 schools and the prevalence of overweight amongst them was found to be 10.2% i.e.9.5% in boys and 10.9% in girls. Prevalence of obesity was found to be 2% (2% in boys and 2% in girls).

**Comparison with other studies**

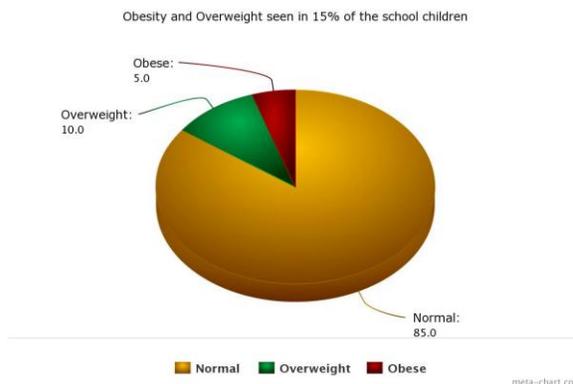
*Kerala based study*

Girls -Obese- 2.25%    Overweight-11.92%

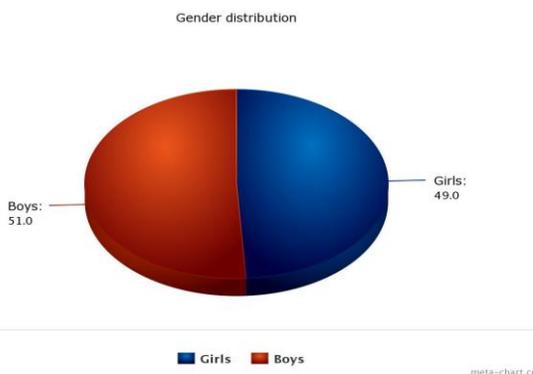
Boys -Obese- 2.93%    Overweight- 8.31%

*Ludhiana Based study*

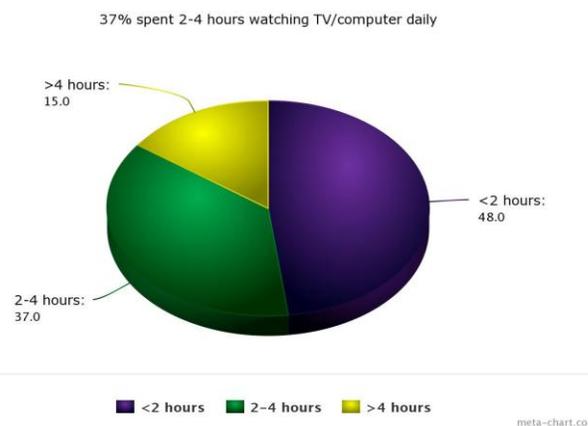
Girls and Boys- Obese - 3.63%    Overweight- 4.7%



**Fig. 3: Time spent on exercise**



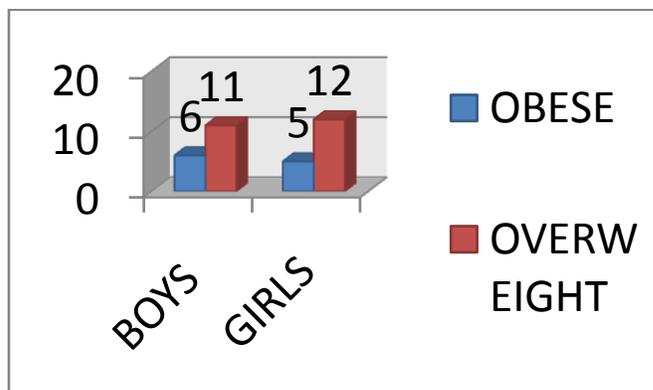
**Fig. 1: Almost equal representation of both sexes**



**Fig. 4-Time spent watching T.V/Computer**



**Fig. 2: Distribution of overweight and obesity**



**Fig 5.-Prevalence of obesity and overweight**

The study highlighted that a majority of students i.e.70% spent less than an hour on exercise, only 7% spent more than 2 hours on exercise. And some 23% spent 1-2 hours on regular exercise which highlighted that lack of exercise can be a major factor in the rise of overweight and obesity amongst these children.

37% students included in the study spent 2-4 hours watching television or playing on the computer, while only 15% spent less than 2 hours watching T.V.

Obesity in adolescents and children has risen to significant levels globally with serious public health consequences [10]. In addition to cardiovascular, emotional and social issues, it poses a serious hazard to the basic health care delivery system [11]. Unless this epidemic is contained at a war footing, the implications of this global phenomenon on future generations will be serious. The reversibility of this disease with suitable intervention strategies should be seen as an opportunity and efforts pursued with vigor.

## References

1. Hosein D, Ahmad A, Khan MU, Dhingra S. Canagliflozin: A First-in-Class Medication for the Treatment of Type 2 Diabetes Mellitus. *Int J Toxicol Pharmacol Res.* 2015; 7(2):105-7.
2. Raj M, Kumar R. Obesity in children and adolescents. *Indian J Med Res* 2010; 132: 598-607
3. Goyal R, Shah V, Saboo B, Phatak S, Shah N, Gohel M, Raval Patel S, Prevalence of Overweight and Obesity in Indian Adolescent School Going Children: Its Relationship with Socioeconomic Status and Associated Lifestyle Factors. *JAPI* 2010; 58:151-158.
4. Ji CY, Sun JL, Chen TJ. Dynamic analysis on the prevalence of obesity and overweight school-age children and adolescents in recent 15 years in China. *Zhonghua Liu Xing Bing Xue Za Zhi.* 2004;25(2):103-8.
5. B.T Prasanna, Bengalorkar G, R Deepthi, C Muninarayan, S Ravishankar, Prevalence of overweight and obesity among adolescent school going children (12-15years) in urban area, South India. *IJCRR*, 2012; 4(20): 99-105.
6. Mandal A, Mandal G.C, Prevalence of overweight and obesity among the urban adolescent english medium school girls of Kolkata, India. *Italian journal*, 2012; 9(3):1-6.
7. Mohanty B. The prevalence of overweight & obesity in school going children in Pondicherry, 2007-2008. Available at: <http://dste.puducherry.gov.in/mohanty.pdf>
8. Unnithan, S Syamakumari. Prevalence of Overweight, Obesity and Underweight among School Going Children in Rural and Urban areas of Thiruvananthapuram Educational District, Kerala State (India). *The Inter J Nutri Wellness.* 2007;6(2):1-6.
9. Mohan B, Kumar N, Aslam N, Bangbulla A. Prevalence of sustained hypertension and obesity in urban and rural school going children in Ludhiana. *Ind Healt J.* 2004;56(4);310-314.
10. Akbar N, Aqeel T, Dhingra S. Assessment of Knowledge and Dietary Misconceptions among Diabetic Patients. *J Pharm Pract Community Med.* 2016; 2(1):9-15.
11. Sachdeva M, Dhingra S, Parle M. Dapagliflozin: a new adjunct in the treatment of Type 2 diabetes mellitus. *Int J Basic Clini Pharmacol* 2014;3(4):741-747.

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