

# To study the prevalence of overweight and obesity among school children (13-17yrs) in relation to their socioeconomic status and Eating habits

Garvita Jain<sup>1</sup>, Dr (smt) S.K Bharadwaj<sup>2</sup>, Dr (smt) Abhaya R. Joglekar<sup>3</sup>

<sup>1</sup>Research scholar, Pt. Ravishankar Shukla University, Raipur, Chhattisgarh

<sup>2</sup>Principal, Govt. D.T College, Utai, Durg, Chhattisgarh

<sup>3</sup>Professor, Department of Home science, Dr.R.B Govt Navin Kanya College, Raipur, Chhattisgarh

**Abstract-** Overweight and obesity are important determinants of health leading to adverse metabolic change and increase the risk of non communicable diseases. The objective of this study was to assess the prevalence of overweight and obesity as defined by the CDC growth chart among school going children in Bhilai Nagar, Chhattisgarh correlated with their socioeconomic status and eating habits. The study was carried out in 500 students of 13-17yrs of age having different SES. The obesity and overweight were considered using an updated BMI reference. SES and eating habits were determined using pre-tested questionnaire. The prevalence of overweight/obesity is a problem of affluent children going to various schools in Bhilai city. In the present study it is found that the magnitude of overweight (23.8%) and obesity (8.4%) is very high and alarming for both the sex. eating habits like junk food, chocolate, eating in front of TV etc remarkable effect on prevalence on overweight and obesity among low to high SES group. The study also suggested that under nutrition rates remain high (10.2%) in children. Therefore Special attention has to given for their overall nutrition.

## I. INTRODUCTION

Thirty years ago, fundamental changes in social and economic situation occurred all over the world, thus leading to the presence of modern conveniences in homes as well as in the work place. These changes have shifted societies from communicable to non-communicable diseases (NCD)<sup>1,2,3</sup>. Overweight and obesity are a serious health problem, since they are associated with other diseases, and they contribute to ill health<sup>4</sup>. The world Health Organization (WHO) describes overweight and obesity as one of today's most important public health problems, which is escalating as a global epidemic<sup>5</sup>. It is also increasingly recognized as a significant problem in developing countries and countries undergoing economic transition<sup>6</sup>. The problem of overweight and obesity is confined not only to adults but also being reported among the children and adolescents of developed as well as developing countries. Since, adolescence is a period of transition from childhood to adulthood; it assumed critical position in the life cycle of human beings, characterized by an exceptionally rapid rate of growth<sup>7</sup>. The prevalence of overweight and obesity among children and adolescents has increased significantly in the developed countries during the past two decades<sup>8,9</sup> and similar trends are being observed even in the developing world<sup>10</sup>. In India the problem of obesity has been scantily explored even in the affluent population

groups. Studies from metropolitan cities in India have reported a high prevalence of obesity among affluent school children<sup>11,12</sup>. On the other hand some studies reported a high prevalence of under nutrition among rural school children and children in urban slums<sup>13,14,15,16</sup>. 50-80% of obese children will grow up to become obese adults<sup>17</sup> and it is harder to treat obesity in adults than in children<sup>18</sup>. In children, the development of obesity is associated with the simultaneous deterioration in chronic diseases risk profiles<sup>19,20</sup>. Excess weight in this age is the leading cause of pediatric hypertension, and overweight children are at a high risk for developing long-term chronic conditions, including adult-onset diabetes mellitus, coronary heart disease, orthopedic disorders and respiratory diseases<sup>19,21</sup>. Therefore, it was proposed to carry out a study to assess and identify the prevalence and determinants of overweight and obesity among urban school going children covering statistically adequate sample in Chhattisgarh, Bhilai city which is one of the economically, industrially and culturally fast growing state. Obesity prevalence depended on many factors. During the scanning of relevant literature not a single study was found in impact of obesity in school children has been examined in Chhattisgarh.

Our main objective was to examine the prevalence of overweight and obesity in school children using internationally based cutoff points and compare the relationship between SES factors and eating habits.

## II. MATERIALS AND METHODS

This study was conducted from April 2009 to December 2010. From a list of all public and BSP schools in Bhilai Nagar were selected randomly using a random table. Permission of the school Principals was taken before conducting the study. Total of about 500 children's, *i.e.* 100 children's each of 13-17 yr, about 125 from each of the four selected schools studying in class standards 7th to 12th were included in the study. Classes were selected randomly from each of the four schools and all the children's present in the selected classes were asked to take part in the study. Their informed and written consent to the study was taken. Their exact ages were as ascertained from the school register.

Data was collected in the form of general information. Semi non quantitative food frequency questions were asked in simple language to facilitate better results. Total 31 items were recorded as daily/more than once, once/day, 2-3 times /week, seldom and never; scoring was done accordingly as per the responses. Socio-demographic data were collected in the form of family income, parents' educational status, number of family members and

working status of the parents. All the anthropometric measurement was taken in school premises with standard procedure. We have recorded body weight to the nearest 0.1 kg using a standard balance scale with subjects barefoot and wearing light indoor clothing. Body Height was measured by scale was used up to an accuracy of 1mm. Body mass index (BMI) was defined as the ratio of body weight to body height squared, expressed as kg/m<sup>2</sup>. Overweight and obesity was assessed by BMI for age (6). Student who had BMI for age >85<sup>th</sup> and < 95<sup>th</sup> percentile of reference population were classified as overweight. Students who had BMI for age > 95<sup>th</sup> percentile of reference population were classified as obese. We examined the prevalence of overweight and underweight in each gender by age group, sex and SES. Group comparisons were performed using ANOVA as appropriate.. A p value below or equal to 0.01 was considered to be statistically significant. Influence of various factors on prevalence of underweight, normal, overweight and obesity were expressed in form of percentage. The collected data was entered into the computer using software program MS Excel.

### III. RESULT

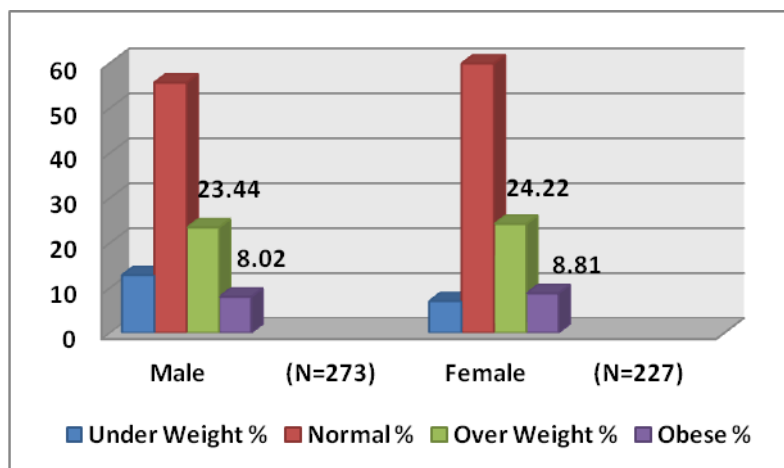
A total number of 500 with age group between 13-17 years from different school were screened for their height, weight and

body mass index. Out of 500 children 273 (%) were boys and 227 (%) were girls. The BMI were little higher in girls than boys (table1). However, these differences were not significantly different with respect to gender. Among the 500 subjects, 23.44% of the males were overweight, and 8.02% were obese, 55.67% normal and 12.82% were underweight. While 24.22% of the female were overweight and 8.81% were obese, 59.91% normal and 7.04% were under weight (table1; figure1).

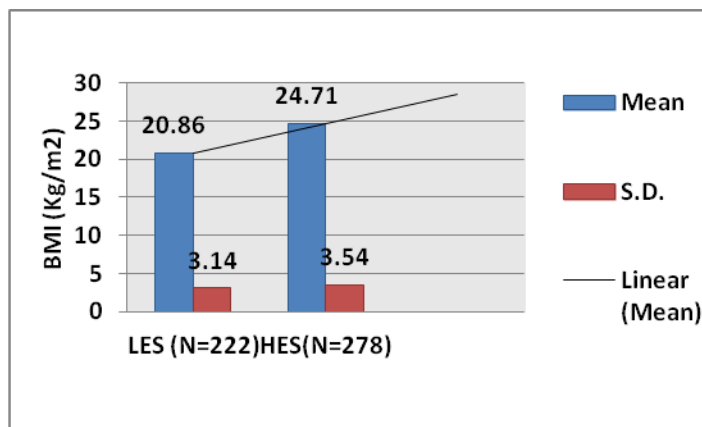
The prevalence of overweight and obesity and its relationships with socioeconomic status are present in table2. The subjects belonging to high socioeconomic status would score significantly higher on body mass index than the subjects from low socioeconomic status group (figure2). The BMI of subjects consuming excessive food is significantly higher than the subjects who consume low calorie food beyond .01 level of significance (table 2). Vegetarian diet or non-vegetarian diet did not have any effect on prevalence of underweight, overweight and obesity, but junk food , beverages and eating meal pattern in front of T.V have more prevalence of obesity and overweight than underweight indicates that caloric intake is associated with increase in BMI.

**Table 1: Overweight /obesity of Subjects on the Basis of Gender and BMI Categories**

Gender	BMI Categories							
	Underweight		Normal		Over Weight		Obese	
	N	%	N	%	N	%	N	%
<b>Male (N=273)</b>	35	12.82	152	55.67	64	23.44	22	<b>8.02</b>
<b>Female (N=227)</b>	16	7.04	136	59.91	55	24.22	20	<b>8.81</b>
<b>Total (N=500)</b>	51	10.2	288	57.6	119	23.8	42	<b>8.4</b>



**Figure1: Relationship of sex of school children with BMI**



**Figure 2: Mean and SD of BMI (Kg/m<sup>2</sup>) of subjects at their Socio-Economic Status Levels**

#### IV. DISCUSSION

The present study showed that the prevalence of overweight was high among children, 23.44% boys, and 24.22% in girls. The relatively high prevalence of overweight (23.8%) is alarming. Overweight children often become overweight adult and overweight in adulthood is a health risk. The obesity was seen in 8.05% of boys and 8.81% of girls. An important finding of this study is an ever burgeoning prevalence of obesity among the school going children when compared to previous survey in India. This study has shown higher figures which is suggestive of the obesity epidemic in 21<sup>st</sup> century. The reason for higher prevalence of obesity among children's due to selection of the subjects from very affluent societies and few schools. The prevalence of overweight and obesity was significantly higher among girls in the present study, which is comparable with figures reported for other developing countries<sup>22,23</sup>.

A clear socioeconomic gradient in the prevalence of overweight and obesity was observed in the present study, which is consistent with those earlier studies who reported that BMI is influenced by different SES backgrounds<sup>22</sup>. The finding of present study showed significantly positive correlation between BMI and excessive food consumption. This agrees with a study done by Thompson et al,<sup>24</sup> where they reported that the frequency of eating quick food was positively associated with BMI z-score in their longitudinal study among girls at Massachusetts institute of technology. Present study focused their analysis on type of diet (vegetarian, egg vegetarian and nonvegetarian), junk food, frequency of eating pattern and eating behavior in front of TV etc because that they have special role in obesity. The dietary indulgence in high fatty foods intake and sedentary life styles in the higher socioeconomic group are well known causes for overweight and obesity. This study has thus highlighted the need to not only improve the awareness on prevention of obesity among children but a need to motivate and reinforce them to practice healthy lifestyle is utmost essential

#### V. CONCLUSION

Overweight (23.8%) and obesity (8.4%) is very high and alarming for both the sex. The prevalence is comparable to other national studies; again there is paucity of data. The study also suggested that under nutrition rates remain high in children. Therefore Special attention has to given for their overall nutrition.

#### REFERENCES

- [1] Ulijaszek S.J. a disorder of convenience. *Obesity Reviews*; (2007) 8(S1): 183-187.
- [2] Farooqi IS, O'Rahilly S. Genetic factors in human obesity. *Obesity Review*; (2007) 8(s1): 37-40.
- [3] Abdul-Rahim Hf, Abu-Rmeileh NME, Husseine A, Homloe-ottesen G, Jervell j, Bjertness E Obesity and selected co-morbidities in an urban Palestinian population. *International Journal of Obesity*; (2001) 25: 1736-174
- [4] Kopelman P. Health risks associated with overweight and obesity. *Obesity Reviews*; (2007) 8(s1): 13-17.
- [5] WHO Nutrition <http://www.who.int/nut/obs/ht>, accessed in 2003.
- [6] Popkin BM. the nutrition transition and obesity in the developing world. *Nutritional Journal*; (2001) 131: 871 s- 873.
- [7] Tanner JM. *Fetus into man: Physical growth from conception to maturity*. New York wells, open book publishing limited, 1978: pp 22-36.
- [8] Chinn S, Rona RJ. Prevalence and trends in overweight and obesity in three cross-sectional studies of British children, *Br Med J*; (2001) 197-494; 322: 24-26.
- [9] Louis A Baur. Child and adolescent obesity in 21<sup>st</sup> century: an Australian perspective, *Asia pacific Journal of clinical nutrition*; (2002) 11(suppl): (s 524- s 528).
- [10] Martorell R, Kettel Khan L, Hugher ML, Grummer Strawn LM. Overweight and obesity in preschool children from developing countries, *Int J Obes Relat Metab Disord*; (2000) 24: 959-967.
- [11] Sundaram KR, Ahuja RK and Ramachandran K. Indices of physical build nutrition and obesity in schoolgoing children. *Indian J Pediatr*. 1988; 55: 889-898
- [12] Gupta AK. and Ahmad AJ. Childhood obesity and hypertension. *Indian Pediatr*. 1990; 27: 333-337. Kapil U, Singh P, Pathak P, Dwivedi SN. and Bhasin S. Prevalence of obesity amongst affluent adolescent school children in Delhi. *Indian Pediatr*. 2002; 39: 449-452.
- [13] Sachdev HPS. Recent transitions in anthropometric profile of Indian children: clinical and public health implications. *F.I. Bull*. 2003; 2 4: 6-8.

- [14] Bhargava SK, Sachdev HPS, Fall CHD, Osmond C, Lakshmy R, Barker DJP, Biswas, SKD, Ramji S, Prabhakaran D and Reddy KS. Relation of serial changes in childhood body-mass index to impaired glucose tolerance in young adulthood. *N. Engl. J. Med.* 2004; 350: 865-875.
- [15] Vedavathi S, Jayashree R, RafiM. Prevalence of Overweight & Obesity in Affluent adolescent school girls in Chennai in 1981 & 1998. *Indian Pediatrics*, 2003; 40; 775-779.
- [16] Kapil U et al. Prevalence of obesity among Affluent adolescent school children in Delhi. *Indian Pediatrics*. 2002; Vol 39: 449- 452.
- [17] Styne DM. Childhood obesity and adolescent obesity: PCNA. 2001; 48: 823-847.
- [18] Park K. Park's textbook of Preventive and Social Medicine: Banarsidas Bhanot Publishers, 18th Edition. 2005; 316- 319.
- [19] Dietz WHJ. Obesity in infants, children, and adolescents in the United States. Identification, natural history, and aftereffects. *Nutr Res.* 1981; 1: 117-137.
- [20] Aristimuno GG, Foster TA, Voors AW, Srinivasan SR, Berenson GS. Influence of persistent obesity in children on cardiovascular risk factors: the Bogalusa Heart Study. *Circulation* 1984; 69: 895- 904
- [21] Dietz WH. Childhood weight affects adult morbidity and mortality. *J Nutr* 1998; 128: (Suppl 2) 411S-414S.
- [22] Kaur S, Kapil U, Singh P. Pattern of chronic diseases amongst adolescent obese. *Children in developing countries cur Sci.*; (2005) 88: 1052-6.
- [23] Sakmota N, Wansorns S, Tantrisirink, Marni E. A social epidemiological study of obesity among preschool children in Thailand. *Int J Obes Relat Metab Disord*; (2001) 25: 389-94.
- [24] Thompson OM, Ballew C, Resnicow K, Must A, Bandini LG, Dietz WH. Food purchased away from home as a predictor of change in BMI z-score among girls. *International Journal of obesity and Relate Metabolic Disorder*; (2004) 28(2):282-9.

#### AUTHORS

**First Author** – Garvita Jain Research scholar, Pt. Ravishankar shukla university, Raipur, Chhattisgarh.  
Email id - [garvita\\_jain24@rediffmail.com](mailto:garvita_jain24@rediffmail.com)

**Second Author** – Dr (smt) S.K Bharadwaj Principal, Govt. D.T College, Utai, Durg, Chhattisgarh.

**Third Author** – Dr (smt) Abhaya R. Joglekar Professor, Department of Home science, Dr.R.B Govt Navin Kanya College, Raipur, Chhattisgarh.  
Email id - [abha\\_abhaya@yahoo.co.in](mailto:abha_abhaya@yahoo.co.in)