

## **Research Article**

# **Prevalence of Overweight and Obesity in Young South Indian Rural, Urban Adolescents in the Age Groups 15 To 25 Years**

**P. Raghu Ramulu\***, Irfana. S, P.Lakshmi Rajyam, S. Vijaymohan, E. Dayakar, Hema Chandra Panigrahy  
Department of General Medicine, Bhaskar Medical College, Yenkapally, Moinabad, R.R (Dt), Hyderabad– 500075,  
India

### **\*Corresponding author**

P. Raghu Ramulu

**Email:** [mohdfazil\\_pharma@yahoo.co.in](mailto:mohdfazil_pharma@yahoo.co.in)

---

**Abstract:** The aim and objective of the study was to assess the prevalence Of Obesity and overweight in young adolescent in the age group 15 to 25years.It has become a worldwide epidemic, and there is an urgent need to examine obesity and overweigh in developing countries like India using Asian pacific standard for BMI. In the present study we have investigated the prevalence of obesity and overweight and their association with socioeconomic status (SES) and the risk factors like diet, physical activity like exercise, sports,, eating habits like junk food, chocolate, eating outside at weekend, family history of diabetes and obesity. The study was carried out in 727adolescents between 15 to 25years of age and having different socio economic standards the obesity and overweight were considered using Asian pacific body mass index reference. Life style factors were determined using pre-tested questionnaire. Prevalence of overweight was found to be 14.3% among boys and 9.2% among girls where as the prevalence of obesity was 2.9% in boys and 1.5% in girls. The prevalence of overweight among adolescent was higher in middle SES as compared to high SES group in both boys and girls whereas the prevalence of obesity was higher in high SES group as compared to middle SES group. The prevalence of obesity as well as overweight in low SES group was the lowest as compared to other group. Eating habit like junk food, chocolate, eating outside at weekend and less physical activity like exercise, sports, &having more study hrs in medical student's effect on prevalence of overweight and obesity among middle to high SES group. Family history of diabetes and obesity were found to be positively associated. This study further extends the clinical usefulness to predict prediabetic and diabetic in the young adolescent.

**Keywords:** Overweight, Obesity, Adolescents, Body Mass Index

---

## **INTRODUCTION**

Overweight and obesity has reached epidemic in developed countries and is rapidly increasing in many middle-income and less-developed countries [1]. The proportion of adolescent in the general population who are overweight and obese has doubled over the past two decades in developed and developing countries including India India has largest no of T2DM cases in the world prevalence of diabetes 40million in 2007and is predicted to increase to 70 million by the year 2025 [2] adolescent obesity increases the risk of adult obesity as well as chronic health problems such as type II diabetes, hypertension and overweight have a profound influence on morbidity and mortality in adult life[3-6]. It has been reported that population prevalence of overweight increased by 60-70% [7].

There are some studies on adults which have examined the relationship between socioeconomic status and dietary factors and life style leads to cardiovascular disease[8-10].Obesity and overweight have become a global epidemic, and it is still

increasing in both industrialized and developing countries" Obesity and overweight are an increasingly prevalent nutritional disorder among children and adolescents in the world." Numerous health risks have been associated with adolescent overweight, including hypertension, respiratory disease, several orthopedic disorders, diabetes mellitus and elevated serum lipid concentrations [11]. Due to the difficulty of curing obesity and over weight in adults and the many long-term adverse effects of adolescent obesity, the prevention of adolescent obesity has been recognized as a public health priority [12].

Diet and lifestyle are possibly major contributors to weight problems and varies with different SES especially countries like India [13, 14]. 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 [15,16]

Our main objective was to examine the prevalence of adolescent obesity and overweight using Asian pacific based BMI reference and compare the relationship between SES factors and associated dietary and life style factors for obesity and overweight. We designed a study to determine the prevalence of overweight, obesity and its association with diet, sedentary life style, socio-economic status and physical activity in young adolescents of a small province in India.

**METHODOLOGY**

Study design; was population based, duration; six months(6<sup>th</sup> June to 5<sup>th</sup> December 2013.The study included 727 adolescents in the age group of 15to25 years; 324 were boys and 403 were girls. The urban subjects were from different zones in the metro city of greater Hyderabad ,and rural subjects were patients from RangaReddy dist(urban,semi

urban, rural, ie. Bhaskar Medical College students out patients their attenders ) different socio-economic status, ethnic variability and gender. For low-income group (*n* =1) and a middle income (*n*=2) and high-income groups (*n*=3) were chosen. The Research Ethics Committee has approved the protocol for study. Informed consent was obtained from the adolescents’ and also to collect data by questionnaire from them. The questionnaire provided information on socioeconomic status of parent’s profession. The subjects were advised to Complete the data of the questionnaire, Asian pacific reference for BMI were used for all the subjects. Data on weight and height were collected for each through direct physical examinations. Height and weight were measured using standard procedure and BMI (kg/m<sup>2</sup>) was calculated. Measurements were made by two trained technicians. The BMI of each adolescent was determined. The number of underweight, normal, overweight and obese was calculated.

**Table 1: Characteristics of height and weight, normal-weight, overweight and obese boys in years 15-25**

Characteristics	Under	Normal	Obese	Overweight
Age 15-25	11.1	72.5	14.3	2.9
Participates in sports				
Yes (%)	57.3	52.3	43.8	32.2
No (%)	36.8	35.9	56.3	67.8
Physical exercise				
Yes (%)	58.4	52.6	38.5	27.1
No (%)	41.6	47.4	61.5	72.9
Diet habit				
Vegetarian (%)	96.0	95.7	91.7	89.8
Nonvegetarian(%)	4.0	4.3	8.3	10.2
Restaurant visit a week				
Visits more than once (%)	77.0	82.6	86.1	87.9
Visits once or no (°/0)	23.0	17.4	13.9	12.1
Takes junk food regularly (%)				
Yes (%)	46.9	57.3	63.9	67.8
No (%)	53.1	42.7	36.1	32.2
Chocolate eating habit				
Yes (%)	43.9	55.7	60.4	66.1
	56.1	44.3	39.6	33.9
Family history of diabetes (%)				
Yes (%)	18.8	20.7	23.6	23.7
No (%)	81.2	79.3	76.4	76.3
Family history of obesity (%)				
Yes (%)	23.6	26.2	35.3	39.0
No (%)	76.4	73.8	64.7	61.0

Socioeconomic status of parents was classified as high socioeconomic group, middle socioeconomic group and lower socio-economic group based on the occupations of parents and family income which were found to be a reliable index of SES [17,18]. Family income data were collected at the same time children's BMI measurements were collected. Trained interviewers administered the questionnaire to all adolescents who attended out patient on the day of the survey.

The questionnaire assessed life style, physical activity and social factors that influence physical and psychosocial health of representative samples of adolescents. Questionnaire items assessed were socioeconomic status, participation in sports, physical exercise, diet (having vegetarian or non vegetarian food), having junk food or not,

chocolate eating habit, frequency of visiting restaurants per week. The present study also assessed family history of diabetes and obesity. Trained interviewers administered the questionnaire to all subjects who attended on the day of the survey.

**Statistical Analysis**

Body mass index (BMI, kg/m<sup>2</sup>) was calculated on measured height and weight and was used to identify underweight, overweight and obese conditions using age and sex appropriate normative cut points. We examined the prevalence of overweight and underweight in each gender by sex, and SES. Group comparisons were performed using %2 tests as appropriate. Influence of various factors on prevalence of underweight, normal, overweight and obesity were expressed in form of percentage.

**Table 2: Overweight obese girls in years 15-25**

	Under	Normal	Overweight	Obese weight
Age 15-25	8.6	79.0	9.3	1.5
Participates in sports				
Yes (%)	62.3	98.9	44.3	28.6
No (%)	37.7	11.1	55.7	71.4
Physical exercise				
Yes (%)	15.0	38.1	35.4	9.5
No (%)	55.0	61.9	64.6	90.5
Diet habit				
Vegetarian (%)	97.4	95.7	93.7	95.2
Nonvegetarian(%)	2.6	4.3	6.3	4.8
Restaurant visit a week				
Visits more than once (%/0)	66.7	82.3	86.4	92.2
Visits once or no (%)	33.3	17.7	13.6	7.8
Takes junk food regularly				
Yes (%)	45.9	53.4	63.3	76.2
No (%)	54.1	46.6	36.7	23.8
Chocolate eating habit				
Yes (%)	44.4	51.7	71.4	85.7
No (%)	55.6	48.3	28.6	14.3
Family history of diabetes				
Yes (%)	18.2	21.3	24.1	23.8
No (%)	81.8	78.7	75.9	76.2
Family history of obesity				
Yes (T)	33.3	23.3	35.4	47.6
No (%)	66.7	76.7	64.6	52.4

**RESULTS & DISCUSSION**

A total number of 727 adolescents with age group between 15 to 25 years from different zones were screened for their height, weight and body mass index and also for Hip & waist circumference ratio. Out of 727 adolescents 510 were urban, 217 were rural, 324 were boys and 403 were girls. The height, weight and BMI were higher in boys than girls.

However, these differences were not significantly different with respect to gender at any given age. Prevalence of overweight was found to be 14.3% among boys and 9.2% among girls, where as the prevalence of obesity was 2.9% in boys and 1.5% in girls. The prevalence of overweight among adolescents was higher in middle socioeconomic status group as compared to high SES group in both boys and girls, whereas the prevalence of obesity was higher in high

SES group as compared to middle SES group. The prevalence of obesity as well as over wt in low socioeconomic status group was lowest as compared to other groups. Eating habits like junk food, chocolate, ice creams eating outside at weekends and less physical activity like exercise, sports due to more study hrs in

medical students, also spending leisure hrs with computer games & internet effects on prevalence of over wt and obesity among middle to high SES group. Family history of diabetes and obesity were found to be positively associated.

Overall distribution of boys and girls for prevalence of normal, overweight and obesity

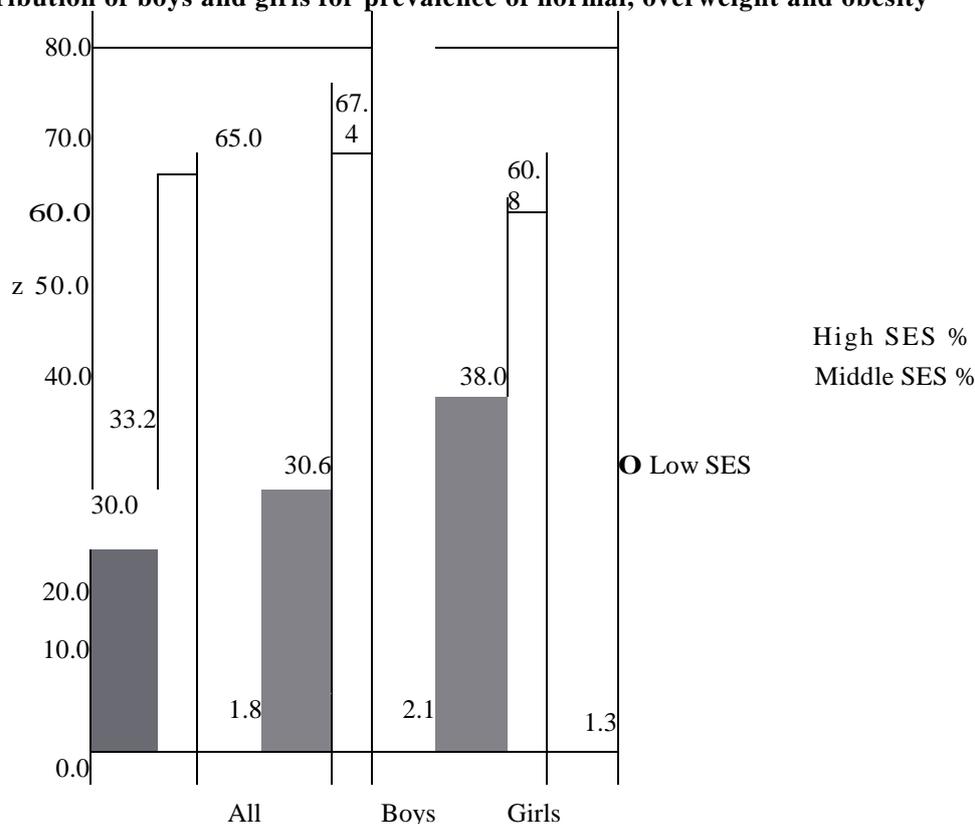


Fig. 1: Overall prevalence of overweight and its relationships with socioeconomic status among adolescent

**CONCLUSION**

This study further extends the clinical usefulness to predict prediabetic and diabetic in the young adolescent.

**REFERENCES**

1. Shear CL, Freedman DS, Burke GL, Harsha DW, Webber LS, Berenson Ros JC *et al.*; Changes in body GS. Secular trends of obesity in early life: the Bogalusa Heart Study. *Am J Public Health*, 1988; 78:75-77.
2. Troiano RP, Flegal KM; Overweight prevalence among youth in the United States: why so many different numbers? *Int J Obes Relat Metab Disord.*, 1999; 23: S22-S27.
3. Bray GA, Bouchard C, James WPT; *Handbook of Obesity*. New York: Marcel Dekker, 1998.
4. Must A, Strauss RS; Risks and consequences of childhood and adolescent obesity. *Int J Obes Relat Metab Disord.*, 1999; 23:S2-S11.
5. Cole TJ, Bellizzi MC, Flegal KM, Dietz WH; Establishing a standard definition for child overweight and obesity worldwide: international survey. *Br Med J.*, 2000; 320:1240-1243.
6. Guillaume M; Defining obesity in childhood: current practice. *Am J Clin Nutr.*, 1999; 70:126S-130S.
7. Stunkard AJ, Sorensen TIA; Obesity and socioeconomic status-a complex relation. *N Engl J Med.*, 1993; 329:1036-1037.
8. Lahmann PH, Lissner L, Gullberg B, Berglund G. Sociodemographic factors associated with long-term weight gain, current body fatness and central adiposity in Swedish women. *Int J Obes Relat Metab Disord* 2000; 24:685-94.
9. Parsons TJ, Power C, Logan S, Summerbell CD; Childhood predictors of adult obesity: a systematic review. *Int J Obes Relat Metab Disord.*, 1999; 23: S101-S107.
10. Sobal J, Stunkard AJ; Socioeconomic status and obesity: a review of the literature. *Psychol Bull.*, 1989; 105: 260-275.
11. Gortmaker SL, Dietz WH Jr, Cheung LW; Inactivity, diet and the fattening of America. *J*

- Am Diet Assoc., 1990; 90: 1247-1255.
12. Power C, Lake JK, Cole TJ; Measurement and long-term health risks of child and adolescent fatness. *Int J Obes Relat Metab Disord.*, 1997; 21: 507-526.
  13. Sobal J; Obesity and socioeconomic status: a framework for examining relationships between physical and social variables. *Med Anthropol.*, 1991; 13: 231-247.
  14. Sobal J; Social and economic consequences of overweight in adolescence. *N Engl Med.*, 1994; 330: 647.
  15. Booth ML, Chey T, Wake M, Norton K, Hesketh K, Dollman J *et al.*; Change in the prevalence of overweight and obesity among young Australians, 1969-1997. *Am J Clin Nutr.*, 2003; 77: 29-36.
  16. Bundred P, Kitchirter D, Buchan I; Prevalence of overweight and obese children between 1989 and 1998: population based series of cross sectional studies. *Br Med J.*, 2001; 322: 326-328.
  17. Taylor CB, Jatulis DE, Winkleby MA, Rockhill BJ, Kraemer HC; Effects of life-style on body mass index change. *Epidemiology*, 1994; 5: 599-603.
  18. Stunkard AJ, Sorensen TIA; Obesity and socioeconomic status-a complex relation. *N Engl J Med.*, 1993; 329: 1036-1037.