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Original Research Article

Prevalence of Overweight and Obesity in Adolescents of South India

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Abstract: The present study is to assess the prevalence of overweight and obesity among urban & rural adolescents of south India. The data were derived from cross-sectional sampling of children, 165 in rural and 204 in urban, aged 13– 17 years in year of 2015. To define overweight and obesity, Age, gender and body mass index (BMI) were used. The present study shows that the obesity significantly increased from 12.9 % in rural to 15.2% in urban, whereas underweight decreased from 13.6 % to 4.6%. There was a significantly higher risk of being overweight and obese in urban males than rural. The present study showed the increasing in prevalence of overweight and obesity in urban male adolescents.
Keywords: Obesity, Adolescent, Body Mass Index (BMI), Overweight.

INTRODUCTION

Obesity in general is defined as the presence of excess adipose tissue in the body to such a degree that it may lead to health hazards[1,2]. Obesity has become a global health problem. Adolescence is the period during which lifelong habits are developed. Rising prevalence of obesity in India may be attributed to various factors, like sedentary life-style, unhealthy food habits, cultural practices and increasing affluence of middle class population[3]. Further, obesity is associated with multiple co-morbidities such as type 2 diabetes mellitus, dyslipidemia, polycystic ovarian disease, hypertension, and the metabolic syndrome, which are increasingly becoming common among children and urban adolescents[4,5,6]. The National Family Health Survey (NFHS-3) 2005–RURAL data showed that combined prevalence of obesity was 9.3% and 12.6% among men and women aged 15–49 years, respectively [7].

Overweight and obesity and their health consequences have been recognized as major public health problems worldwide. A significant increasing trend in the prevalence of overweight and obesity among children and adolescents has been documented over the last few decades in developed and developing countries.[8,9] A cross‑sectional study conducted in Mysore city by Premanath *et al*.[10] showed the prevalence of overweight and obesity in school children aged between 5 and 16 years to be 8.5% of overweight and 3.4% of obesity in the urban area respectively, but there is no report regarding rural area study. Studies across the country have reported the prevalence of obesity in the range of 3-29%[11,12].

MATERIALS AND METHODS

Anthropometric measurements were undertaken in 165 in rural and 204 in urban adolescent children (aged 13– 17 years) from private school and Junior college of Telangana state, Ranag reddy District. Two private secondary school and Junior college from rural area of Telangana state and two private secondary school and Junior college from urban area of Ranag reddy District were randomly selected and enrolled for the study. Each standard is further divided into sections depending on the number of students. Our team of researchers visited each school and Junior college during an allocated time in the morning for measurement of anthropometric indices. Body weight (kg) and body height (m) were measured with subjects wearing light clothing without shoes and the body mass index (BMI) was calculated as weight in kilograms divided by the square of the height in meters. All data were collected during the period between August 2015 and November 2015. Generally, age 13 and 17 correspond to Standard VII and XII, respectively in the Indian Education system. All participants gave informed consent with parents' written consent and Prior approval from Principal had been concluded. Only children without history of any active disease or significant past medical history were included in the study.

Definitions of overweight and obesity

Three criteria were used for the definitions of overweight and obesity:

1. An international BMI-for-age reference curve for defining overweight and obesity in children 2 to 18 years of age by the US National Center for Health Statistics, Centers for Disease Control and Prevention (CDC) and the International Obesity Task Force (IOTF) in 2000 (IOTF criteria)14. These criteria were based on median BMI [BMI, the weight in kilograms divided by the square of the height in meters] by age and gender in six nationally representative datasets from Brazil, Hong Kong, Netherlands, Singapore, the UK and the US from an international growth survey in 2000. These surveys had over 10,000 subjects each and together covered 97,876 boys and 94,841 girls. Overweight and obesity were defined as BMI-for-age ≥ 25 and ≥ 30 kg/m2 respectively.

2. A Chinese national BMI reference curve for Chinese children and adolescents reported by the Group of China Obesity Task Force (COTF) in 2004 (COTF criteria)15 - These criteria were based on the Chinese National Survey on Students Constitution and Health in 2000 involving 244,200 primary and secondary Chinese students aged 7–18 years. Overweight and obesity were defined as BMI for- age ≥ 24 and ≥ 28 kg/m2 respectively.

3. CDC 2000 Growth Charts for the United States (CDC criteria)16 - These criteria were based on the US National data collected in a series of 5 surveys between 1963 and 1994 for children and adolescents aged 2–20 years. Overweight and obesity were defined as BMI-for-age ≥ 85 and ≥ 95 percentiles respectively. We have follow IOTF criteria for our research.

Statistical Analysis

All data are expressed as mean ± SD or n (%) where appropriate. Chi-square tests and Student's t test were used for group comparisons. A *p*-value < 0.05 was considered as significant.

RESULTS

In the present Study adolescents population consist of 165 in rural and 204 in urban 13–17 year old children from telangana state. The overall mean BMI increased significantly (Table 01 & Fig 1).

Prevalence of overweight increased non-significantly from 25.4% in rural to 26.6% in urban while obesity prevalence increased non-significantly from 12.9% in rural to 15.2% in urban (Table 2 and Fig 2).

Males showed a significant increase in prevalence of both overweight and obesity. While in females, the prevalence of overweight decreased and though the prevalence of obesity in females was higher than males, there was only a small non-significant increase in its prevalence (Table 3 & 4).

Table-1: Percentage Comparison of BMI (Kg/m2) in Rural and Urban area

Category	Rural	Urban
BMI of Males	18.1 +/- 1.2	21.6 +/- 4.9
BMI of Females	21.4 +/- 6.2	22.48+/- 3.2

All data are expressed as mean ± SD

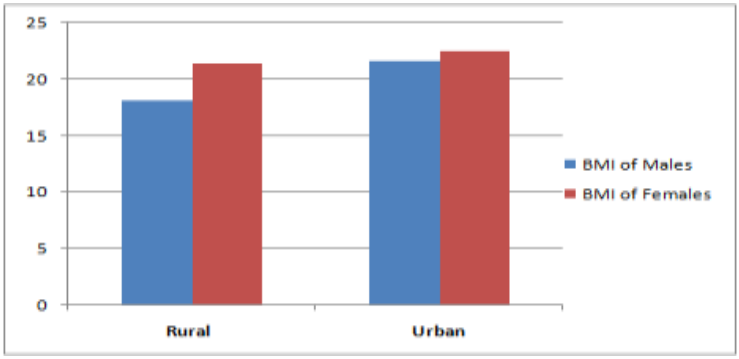

Fig 1: Percentage Comparison of BMI (Kg/m2) in Rural and Urban area

Table 02: Percentage Comparison of Adolescent in Rural and Urban area

Category	Rural	Urban
Underweight	13.6	4.6
Overweight	25.4	26.6
Obesity	12.9	15.2

All data are expressed as mean ± SD

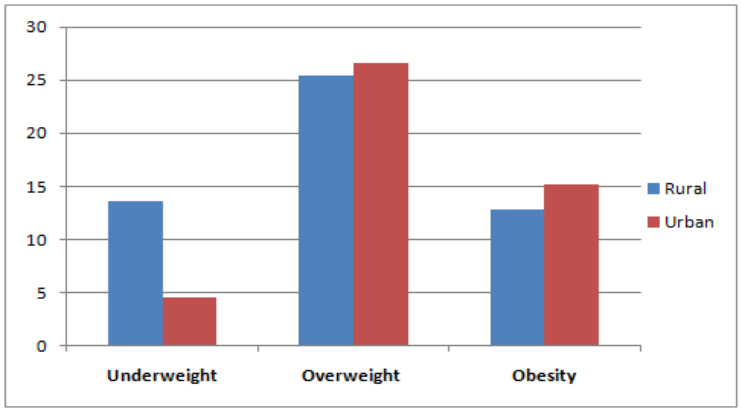

Fig 2: Percentage Comparison of Adolescent in Rural and Urban area

Table 3: Percentage of Overweight Adolescent in Rural and Urban urea

Category	Rural	Urban
BMI of Males	26.2	28.2
BMI of Females	26.8	25.0

All data are expressed as mean ± SD

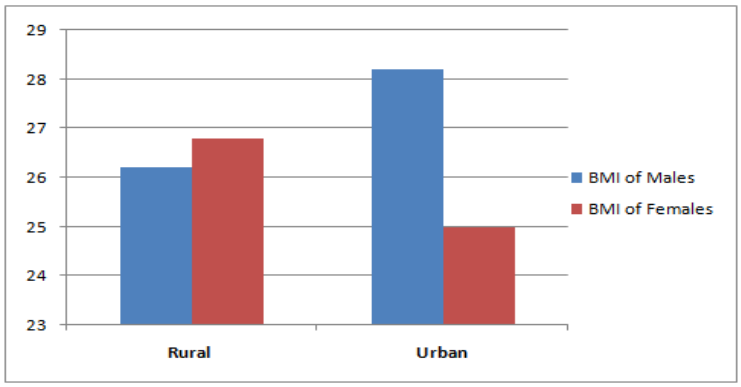

Fig 3: Percentage of Overweight Adolescent in Rural and Urban area

Table 04: Percentage of Obese Adolescent in Rural and Urban area

Category	Rural	Urban
BMI of Males	11.8	14.5
BMI of Females	14.6	15.4

All data are expressed as mean ± SD

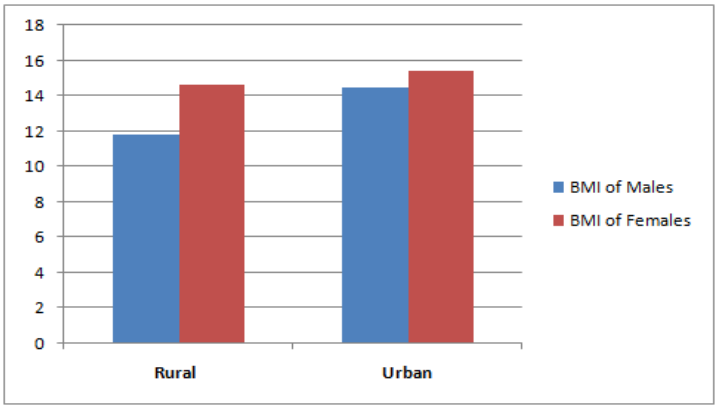

Fig 4: Percentage of Obese Adolescent in Rural and Urban area

DISCUSSION

Obesity is associated with significant morbidity and mortality [13]. There is now growing concerns on the increasing prevalence in childhood obesity and most obese children will grow up to become obese adults and most obesity related health problems are also applicable to children[14,15]. This is the study on in the prevalence of childhood obesity in the Indian subcontinent. Our study demonstrated an increase in prevalence of both overweight and obesity and a decrease in prevalence of underweight in urban adolescents aged 13–17 years than rural sc. Further, it we reported that the increase was significantly higher in males urban families. Emerging problem of childhood obesity is of high importance in developing countries like India. These shifts are largely associated with behavioral changes in dietary profile and lifestyle and decreased indulgence in physical activity[16].The transitions are more rapid in young individuals.

The increasing trend of childhood overweight and obesity may further increase the enormous burden of type 2 diabetes and cardiovascular diseases in India and impact the economy of the nation and its growth [17,18]. Studies from South India have reported an obesity prevalence of 3.6% in adolescents of age-group 13–18 years of Chennai in year 2002 and 3.4% in children and adolescents of age-group 5–16 years of Mysore in year 2009[19,20]. Several cross-sectional studies Thus in the present study shows the male gender was associated with a higher risk of being overweight and obese than females in urban than in Rural.

CONCLUSIONS

Higher prevalence rates of overweight/obesity were seen in urban areas. In conclusion, we report that the prevalence of obesity has increased in urban adolescents aged 13–18 years in India. In addition, male gender and higher socioeconomic status is associated with a significant risk of being both overweight and obese. Hence from this study, it is concluded that the male gender was associated with a higher risk of being overweight and obese than females in urban than Rural. This study further extends the clinical usefulness to predict prediabetic and diabetic in the young adolescent.

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