

## A Comparative Study of Prevalence of Obesity among Adolescent boys and girls in the Capital city of Odisha, India

Jyotirmayee Udgata<sup>1</sup> and Chinmayee Sahoo<sup>2\*</sup>

<sup>1</sup>Associate Professor in Post Graduate Department of Home Science,  
Rama Devi Women's University, Bhubaneswar (Odisha), India.

<sup>2</sup> Lecturer in Home Science, Jawaharlal Nehru College, Kuanpal, Cuttack (Odisha), India.

(Corresponding author: Chinmayee Sahoo\*)

(Received: 17 March 2023; Revised: 26 April 2023; Accepted: 05 May 2023; Published: 20 May 2023)

(Published by Research Trend, Website: www.researchtrend.net)

**ABSTRACT:** The incidence of obesity among adolescents is being raised across the globe. The adolescents with obesity are at higher risk of chronic diseases like cardiovascular diseases, high blood pressure, diabetes, high cholesterol, metabolic disorder etc. Apart from this they face psychological problems like depression, anxiety and develop low self-esteem and strained peer relationship due to distorted body image. There are many contemporary researches in this area. But the researcher focussed here on comparative analysis of prevalence of obesity among adolescent boys and girls. The present study revealed the prevalence of obesity among boys and girls who belongs to the age group of 13 to 18 years. There were 120 samples chosen at random from different locations of Bhubaneswar, the capital city of Odisha by home visit method. Descriptive statistics like percentage, frequency and correlation coefficient are used to analyse the data. The findings reveal that, the girls were comparatively more obese than boys in their late adolescence than early adolescence. Irrespective of their sex, all of them were found to be in the Grade-I obesity category. Weight, height, and WHR (Waist-Hip Ratio), all exhibited a positive correlation with BMI (Body Mass Index).

**Keywords:** Adolescents, overweight, obesity, BMI (Body Mass Index), WHR (Waist Hip Ratio).

### INTRODUCTION

Adolescence ranging from the age of 10–19 years is a transitional phase that leads to attaining puberty and adulthood. This phase involves major physical, psychological and behavioural changes and any adversity in this developmental phase may bring serious health outcomes involving chronic morbidity and mortality risks. Obesity is one of the major health problems that adolescents are suffering now a days. About one in every six adolescents worldwide, aged 10 to 19, has excess body weight, according to a 2016 World Health Organization (WHO) assessment. India has the world's highest adolescent population, with 253 million adolescents (21 percent of the overall population). According to the ideal height and weight tables for Indian men and women, obesity is a condition where the body weight is 10–20 percent higher than the mean standard weight for age, height, and sex. It is characterised by a generalised accumulation of extra adipose tissue in the body that results in more than 20% of the desired weight. Integrational elements, such as social, cultural, behavioural, psychological, and genetic factors, among others, also substantially contribute as causal factors for the same. Adolescence is a phase of rapid growth and development during which physical, physiological and behavioural changes occur. Morbidity and mortality occurring in this age group is mostly due to preventable causes. Young and growing children have poor knowledge and lack of awareness about physical

and psychological changes that occurs during adolescence and the ill health affecting them. (Sivagurunathan *et al.*, 2015). An adolescent's environment has an impact on whether or not they are directly exposed to healthy foods. Parents, schools, day-care centres, and summer camps are the environmental niches that most adolescents receive their nutritional experiences, knowledge, perceptions, and habits (Bhoge, 2015). Overweight and obesity are among the most significant public health issues of our day, according to the World Health Organization (WHO), and they cause 2.6 million deaths globally each year. Adolescents are mostly adopting sedentary lifestyle habits due to the fast rise of urbanisation, industrialisation, and globalisation. They are consuming calorie-rich foods like junk food, fried foods, desserts etc. Obesity in adolescents leads to numerous health problems like hypertension, cardiovascular disease, diabetes, etc. One of the causes of adolescent obesity is watching television since many adults and teens munch on fried, fatty foods and consume soft beverages to pass the time. This study is primarily concerned with teenagers of both sexes because they are in a crucial developmental period and readily take preventive measures to lose weight. In contrary to many research revealing the higher prevalence of obesity among adolescents, the study conducted by Udgata *et al.* (2022), on Nutritional status of early adolescent girls and Mid -Day Meal programme in middle schools in Mayurbhanj district of Odisha revealed that among 60 numbers of early adolescent girls, only 3.33% girls were

overweight and negligible proportion of the sample (1.66%) were obese. Adolescent obesity prevention programs focused on increasing physical activity levels in teenagers should incorporate ways to increase self-efficacy through increased physical activity options. It was also found in a research that higher screen time and male gender were associated with increased risk for generalized and central obesity, respectively. Intervention strategies to prevent the development of obesity should be implemented among adolescent students to encourage regular breakfast intake and adopting healthy dietary and lifestyle behaviors. (El-Kassas and Ziade 2017). Another research shows that furnishing TV sets in bedroom, dining room or kitchen not only increases TV viewing but also worsens dietary habit (Kuei-Fu and Chen-Yi 2016). Therefore, it is important to find out various underlying factors, to have comparisons between them so that inferences can be drawn. And also, to depict the relationship established among different variables such as age, weight, height, BMI and waist-hip-ratio. Some strategy can help to mitigate the problem of obesity like a 6-week yoga and diet change program decreased the bodyweight, skin fold thickness and cholesterol levels of the obese women (Kumar and Patel 2016). A holistic approach to tackle the obesity epidemic with an array of activities from policy making to program implementation, community education to individual knowledge and skill development is required. We need to promote healthy eating and lifestyle modifications in childhood and adolescents to prevent CVD risk in adulthood (Shokeen and Aeri 2017).

## MATERIALS AND METHODS

This study focused on adolescents, specifically those between the ages of 13 to 18. Three locations were chosen at random from the capital city of Odisha, i.e. Bhubaneswar to serve as the research area. These locations are Sisupalgarh, Palaspali, and New Forest Park. For this investigation, which was conducted from 2017 to 2018, a comparative cross-sectional study design was chosen. One hundred twenty adolescents were included in the purposive sample (60 boys and 60 girls). Data were gathered using a personal interview approach using a predesigned and pretested interview schedule by home visit. The study instruments included a weighing machine for measuring weight, a measuring tape for measuring height, a tailor's tape for the waist and hip measurement, and different standardised utensils for assessing food. The collected data were analyzed with the help of some appropriate statistical techniques including percentage, mean and Pearson's correlation.

## RESULT AND DISCUSSION

The adolescents were divided into two age groups: 13 to 15 years old, who made up 35% of the total respondents, and 16 to 18 years old, who made up the remaining 65%. Hence, it may be claimed that 3/5<sup>th</sup> of the respondents were in the age group of 16 to 18 years. According to the Table 2, 29% and 64% of them, respectively, consume

soft drinks and fast food once or twice every week. Around 53% of teenagers eat fast food once per week, and 46% do the same two to three times. The findings of the current investigation is congruent with earlier research of Agostoni *et al.* (2011). Adolescent obesity has been positively linked to eating breakfast away from home, drinking soft drinks, and consuming calorie-dense fast food. Therefore, regular intake of fast food and high-energy-density food should be avoided. Table 3 shows that boys' BMI is 27.76, while girls' BMI is 28.32. Hence it has been concluded that most of the girls are obese than boys. A number of studies (Tapnikar & Dhingra 2017; Cherian *et al.*, 2012) supported these findings that girls were at high risk of being overweight compared to boys. Another study conducted by Chaudhary *et al.* (2017) in their study found that, the prevalence of overweight and obesity was found to be 10.37% and 6.30%, respectively. The prevalence of overweight and obesity was found higher among female adolescent students (57.14% and 58.82%) as compared to male adolescent students (42.86% and 41.18%), respectively. The finding of the present study is supported by the study conducted by Nawab *et al.* (2014) which depicted the fact that the prevalence of both overweight and obesity was higher among males. Statistically significant difference was found in prevalence of overweight and obesity among affluent schools (14.8% and 8.2%) and nonaffluent schools (4.8% and 1.5%). Important determinants of overweight and obesity were increased consumption of fast food, low physical activity level and watching television for more than 2 h/day. The study conducted by Asadinasab *et al.* (2016) depicted that according to the BMI of the female adolescents, 3% of the students were underweight, 82% had normal weight and 4% were obese, which is comparatively lower than the present study.

**Table 1: Age of the respondents.**

Variables	Characteristics	Boys	Girls	Total	Overall percentage
Age	13-15yrs	23	19	42	35
	16-18yrs	57	41	78	65
Total:				120	100

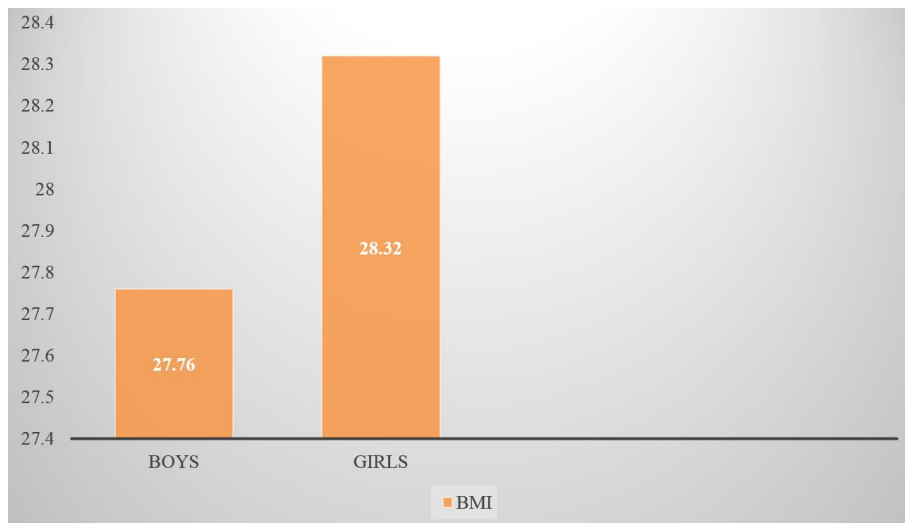
**Table 2: Consumption of Soft Drinks and Fast Food on a Weekly Basis.**

Weekly consumption	Soft drinks	Fast food
Once	77(64.18) *	63(52.5) *
2-3 times	35(29.18) *	55(45.84) *
Daily	8(6.64) *	2(1.66) *
Total:	120	120

N.B. "\*" Figures in parentheses indicates the percentage

**Table 3: Mean score of BMI of boys and girls.**

Variables	Categories	Mean
BMI	Boys	27.76
	Girls	28.32



**Fig. 1.** Mean score of BMI of boys and girls.

**Table 4: Leisure Activities of Adolescents.**

Variables	Categories	Frequency (f)	Overall percentage
Spending leisure time	Watching television	68	56.68
	Chatting and playing games on phones	41	34.16
	Sleeping	6	5
	Reading story books & magazine	5	4.16

Table 6 shows that 56.68 percent of adolescents spend their leisure time by watching television and 34.16 percent spend time by chatting and playing games on phones. The result of the present study is in the same line with the findings of Little *et al.* (2016), which indicate that the number of variables are associated with obesity are mostly spending a lot of time for watching television and doing less physical activity. Watching television acts as a sedentary replacement for physical activity, food advertisements for nutrient-poor, high-calorie foods stimulate food intake and television viewing is associated with “mindless” eating. In addition to decreasing physical activity and increasing the consumption of highly palatable foods, television viewing can also promote weight gain in indirect ways, such as through the use of targeted product placements in television shows; by influencing social perceptions of body image; and airing programs that portray

cooking, eating and losing weight as entertainment. (Boulos *et al.*, 2012).

Table 5 shows that in boys, BMI is moderately correlated with weight having positive correlation. There is positive (very low) correlation of BMI with height of the respondents. Secondly in female BMI is moderately correlated with weight and very low correlation is established between height and BMI. It shows that BMI increases with weight and height. In the overall sample of boys and girls, BMI positively correlates with weight, height and waist hip ratio.

Further it is depicted in the table that, weight of boys is highly correlated with height and there is moderate correlation between weight and height in girls. The relationship between weight and height differs significantly between the two categories. In overall sample, the weight is highly correlated with height and less positively correlated with waist hip ratio.

**Table 5: Correlation of BMI with different variables.**

Gender →	Boys		Girls		Overall		
	Weight	Height	Weight	Height	Weight	Height	WHR
BMI →	0.492*	0.537*	0.392**	0.201**	0.282*	0.286*	0.357*
Weight	-	0.682*	-	0.507**	-	0.720*	0.297*

N.B. \* and \*\* indicates significant at 0.05% and 0.01% level

**Table 6: Correlation of BMI with energy, protein and fat consumption.**

Variables	Carbohydrate	Protein	Fat
BMI	0.115*	0.059**	0.176*

N.B. \* and \*\* indicate significance at 0.05% and 0.01% levels respectively

Table 6 shows that there is a significant positive correlation between BMI with carbohydrate and fat consumption. The study also found a comparatively low positive correlation of BMI with protein consumption compared to carbohydrate and fat consumption.

## CONCLUSION

It was discovered through comparative analysis that girls were more obese than boys. Likewise, girls in their late adolescence are bulkier than those in their early adolescence. The same is true for boys as it is for girls. Regardless of their sexual orientation, they were all classified to be in Grade-I obesity. As we know Grade-I obesity levels can be reduced by preventive measures, becoming more health conscious in terms of healthy food habits and judicious consumption of the right kind of food. The majority of families in today's society are nuclear, and parents rarely push their kids to work and exercise. As a result, they are spending their leisure time in watching television, using their smartphones, and using computers. They disrupt their eating routines and sit for extended periods of time to complete all these tasks. The main causes of adolescent obesity are lack of exercise and excessive calorie intake from junk food and soft drinks.

## FUTURE SCOPE

The findings of this study reveal that obesity especially among adolescent girls is increasing day by day which may develop complications at the time of their pregnancy and motherhood. Irrespective of sex, the obesity in adolescence affects both the boys and girls in developing juvenile life style diseases. The findings of the study reveal a higher rate of prevalence of obesity among the adolescents. Similar kind of study can be conducted in rural areas to compare the prevalence of obesity among adolescents in urban and rural areas. The study throws light on the alarming increase of obesity among the adolescents. Therefore, action research may be carried out on strategies to prevent obesity among the adolescents.

**Conflict of interest.** Nil.

## REFERENCES

- Agostoni, C., Braegger, C., Decsi, T., Kolacek, S., Koletzko, B., Mihatsch, W., ... & ESPGHAN Committee on Nutrition. (2011). Role of dietary factors and food habits in the development of childhood obesity: a commentary by the ESPGHAN Committee on Nutrition. *Journal of pediatric gastroenterology and nutrition*, 52(6), 662-669.
- Asadinasab A., Gheibizadeh M., Fereidoonimoghadam M., Malehi A. S., Abedi P. (2016). A Study of Food Consumption Patterns and Obesity in Female Adolescents in Khorramshahr High School. *Jentashapir Journal of Health Research*, 7(3), 1-6.
- Bhoge, Y. N. (2015). Prevention of Childhood Obesity Food Preferences and Physical Activity. *International Journal on Arts, Management and Humanities*, 4(2), 41-45.
- Boulos, R., Vikre, E. K., Oppenheimer, S., Chang, H., Kararek, R. B. (2012). Obesity: How television is influencing the obesity epidemic. *Physiology and Behaviour*, 107(1), 146-153.
- Choudhary, S. K., Kumar, S., Bharati, D. R., Rajak, B. K., Kumari, S. and Shree, V., (2017). Problem of Obesity among School Going Adolescent in Rural Practice Area of Indira Gandhi Institute of Medical Sciences, Patna. *International journal of scientific study*, 5(3), 102-107
- Cherian, A. T., Cherian, S. S., & Subbiah, S. (2012). Prevalence of obesity and overweight in urban school children in Kerala, India. *Indian pediatrics*, 49(16) 475-477.
- El-Kassas G., Ziade, F. (2017). Exploration of the Risk Factors of Generalized and Central Obesity among Adolescents in North Lebanon. *J Environ Public Health*, 3(1), 234-247.
- Kumar, K. and Patel, S., (2016). Influence of Yoga and Diet Control in Managing the State of Obesity. *Journal of yoga and physiotherapy*, 1(1), 009-0012.
- Kuei-Fu L., Chen-Yi C., (2016). Impacts of lifestyle and socioeconomic status on childhood obesity. *Obesity Research Open Journal*, 3(1), 1-5.
- Little, M., Humphries, S., Patel, K., Dewey, C. (2016). Factors associated with BMI, underweight, overweight, and obesity among adults in a population of rural south India: a cross-sectional study. *BMC obesity*, 3(12), 1-13.
- Nawab, T., Khan, Z., Khan, I.M., Ansari, M. A., (2014). Influence of Behavioral Determinants on the Prevalence of Overweight and Obesity among School Going Adolescents of Aligarh. *Indian journal of public health*, 58(2), 121-124.
- Shokeen, D. and Aeri, B. (2017). Rising Incidence of Overweight and Obesity among Children and Adolescents in India. *International journal life science scientific research*, 3(5), 1329-1399.
- Sivagurunathan, C., Umadevi, R., Rama, R., Gopalakrishnan, S. (2015). Adolescent health: present status and its related programmes in India. Are we in the right direction? *Journal of Clinical and Diagnostic Research*, 9(3), 2596-2608.
- Tapnikar, A. L. & Dhingra, S. (2017). Prevalence of obesity and overweight among high school children in Nagpur, Maharashtra: a cross-sectional study. *Scholars Journal of Applied Medical Sciences*, 5(2E), 638-642.
- Udgata, J., Behera, N. R., Ayushree A. B. R., Munda, M. (2022). Nutritional status of early adolescent girls and Mid-Day Meal programme in middle schools: A case study in Mayurbhanj district of Odisha. *International Journal of Food and Nutritional Sciences*, 11(7), 27-33.
- World Health Organization (WHO). Adolescent health. 27th October 2021. [https://www.who.int/health-topics/adolescent-health#tab=tab\\_1](https://www.who.int/health-topics/adolescent-health#tab=tab_1)
- World Health Organization. WHO 2016 factsheet. <https://www.who.int/news-room/factsheets/detail/adolescents-health-risks-and-solutions>.

**How to cite this article:** Jyotirmayee Udgata and Chinmayee Sahoo (2023). A Comparative Study of Prevalence of Obesity among Adolescent boys and girls in the Capital city of Odisha, India. *Biological Forum – An International Journal*, 15(5): 121-124.