

# To Study the Risk Factors Associated with Overweight and Obesity among Adolescents in Patna, Bihar

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## ABSTRACT

**Introduction:** Obesity is perhaps the most prevalent form of malnutrition. As a chronic disease, prevalent in both developed and developing countries and affecting the adolescent age group due to their improper life style practices. Objective: To Study The Risk Factors Associated with Overweight and Obesity among Adolescents.

**Material and Methods:** A cross sectional study was conducted among 380 adolescents in Urban area of Patna, Bihar. A predefined, pretested questionnaire was used to collect data. Appropriate Statistical tests were used wherever applicable.

**Results:** We observed that among 380 participants, 20.3% of adolescents were overweight or obese. In this study, we found that low intake of vegetable and fruits and lack of yoga practices were the important factors for the occurrence of overweight and obesity. The study showed that there was a significant association between less consumption of vegetable, fruits, yoga practices and the occurrence of overweight and obesity.

**Conclusion:** The urban adolescent population is not conscious enough to seek healthcare until critically ill. Community based studies are required to highlight the problem of overweight and obesity among urban adolescents.

**Keywords:** Obesity, Adolescents, Lifestyle Practices

## INTRODUCTION

Adolescence is a psychological- biological stage of development between childhood and adulthood. Out of 1.2 billion adolescent worldwide about 85% live in developing countries. Adolescent constitute of 21% of Indian population.<sup>1</sup> As per NFHS-3, adolescents in Bihar are 22.5%. As a chronic disease, obesity is prevalent in both developed and developing countries. For industrialized countries, it has been suggested that increase in body weight have been caused by reduced level of physical activity. Overweight and obesity are the fifth risk of global death. In 2008, more than 1.4 billion adults, 20 years and older were overweight. Of these over 200 million men and nearly 300 million women were obese.<sup>2</sup>

Obesity in adolescent is defined as body mass index (BMI) +2 standard deviations, according to WHO age- and gender-specific growth reference charts. Obesity prevalence was higher among younger than older adolescents and generally was higher in boys.<sup>3</sup> Obese children are at greater risk of type 2 diabetes, asthma, sleep difficulties, musculoskeletal problems and future cardiovascular disease, as well as school absence, psychological problems and social isolation.

Many studies have reported socioeconomic differences in

adolescents physical activity, nutrition and risk of overweight or obesity. Although the growing prevalence of overweight and obesity among adolescent has received much attention in recent years but there is not much data available, so the above study was done to find Risk Factors Associated with overweight and Obesity among Adolescents in urban Area of Patna, Bihar. This study was done to assess the risk factors associated with overweight and obesity among adolescents.

## MATERIAL AND METHODS

This was a cross-sectional study conducted amongst 380 adolescents (10–19 years) residing in the urban community in Patna, Bihar, India from January 2016 to December 2016.

**Study Tool-** A predefined semi-structured questionnaire was used that was developed at the Nalanda Medical College, Patna, with the assistance from the faculty members and other experts in relation to overweight/obesity in the adolescent population. The questionnaire included questions regarding the socio-demographic profile of the individual and their family along with their dietary and lifestyle practices. The questionnaire was used in local language.

### Data collection

Study protocol was presented among the Ethics Committee and informed verbal consent was obtained from all the respondents. The purpose of the study was explained to all the participants.

**Inclusion Criteria-** Those participants who were willing to participate.

**Exclusion Criteria-** Those participants who were ill and not willing to participate.

### Case definitions used in this study:

#### Overweight and obesity

According to WHO classification, obesity is classified as BMI  $\geq 30.0$ .<sup>4</sup>

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Age (in years)	10-12		13-15		16-19		Total
	M	F	M	F	M	F	
Normal	18	5	85	59	90	46	303
Overweight	11	12	7	9	11	13	63
Obese	1	3	3	2	1	4	14
Total	30	20	95	70	102	63	380

M=Male, F= Female

**Table-1: Overweight/Obesity among Participants**

Factors	Overweight/Obesity (%)		Total (%)	Chi- Square
	Present	Absent		
Vegetable consumed				
-Regularly	57(15.0%)	250(65.8%)	307(80.8%)	$\chi^2=7.33$ , df=2, p value <0.05
-Sometimes	20(5.26%)	50(13.2%)	70(18.42%)	
-None	2(0.7%)	1(0.26%)	3(0.75)	
Milk consumed				
-Regularly	6(1.6%)	27(7.10%)	33(8.68%)	$\chi^2=0.37$ , df=2, P value >0.05
-Sometimes	65(23.2%)	250(65.7%)	315(82.9%)	
-None	8(2.10%)	24(6.3%)	32(8.15%)	
Fruit consumption				
-Daily	3(0.78%)	21(5.5%)	24(6.31%)	$\chi^2=38.2$ , df=3, P value <0.001
-3-4 times/week	14(3.68%)	58(15.3%)	72(18.9%)	
- occasionally	48(12.6%)	220(57.8%)	268(70.5%)	
-Never	13(3.4%)	3(0.78%)	16(4.2%)	
Tobacco use				
-Yes	6(1.6%)	38(10.0%)	44(11.6%)	$\chi^2=1.44$ , df=1, P value >0.05
-No	72(18.9%)	264(69.5%)	336(88.42%)	
Yoga Practice				
-Yes	4(1.05%)	55(14.5%)	59(15.5%)	$\chi^2=8.09$ , df=1, P value <0.05
-No	74(19.5%)	247(65.0%)	321(84.5%)	
Nature of physical activity at work				
-Light	75(19.7%)	289(76.05%)	364(95.7%)	$\chi^2=0.03$ , df=1, P value >0.05
-Moderate	3(0.8%)	13(3.4%)	16(4.21%)	

**Table-2: Risk Factors of Overweight and Obesity among Adolescent**

### Physical Activity

Those individuals who carry out at least 45 minutes of physical activity of moderate intensity for at least 5 days in a week are known as physically active.<sup>5</sup>

### Smoking

Smoker was defined by any history of single puff of smoking by the participant in the last 30 days.<sup>6</sup>

### Dietary practice

Dietary practices was done by oral questionnaire method (24 hour recall method)<sup>7</sup> five to six interviews were conducted per day.

### STATISTICAL ANALYSIS

The data were entered into MS Excel spreadsheets. Simple proportions, percentages and chi-square were used. Data analysis was done by Epi-Info software.

### RESULT

Among 380 adolescents, majority were of 15 years of age, males were 227 (59.73%) and 153(40.26%) were females. 77(20.3%) participants were overweight/obese and 303 (79.7%) respondents were not overweight/obese. Out of 77 overweight/obese adolescents, 63(16.5%) were overweight

and 14(3.6%) were obese [Table -1].

Most of the adolescents (70.5%) consumed fruit occasionally; 24(6.31%) consumed fruit daily, 72 (18.9%) consumed fruit three to four times/week, and the remaining 16 (4.2%) did not consume fruit. Out of 380 adolescents, 59(15.5%) practiced yoga and 44 (11.6%) used tobacco [Table-2]. 307(80.9%) consumed vegetables daily and there was significant association between less consumption of vegetable and occurrence of overweight/obesity ( $\chi^2=7.33$ , df=2,  $P < 0.05$ ), low intake of fruit and overweight/obesity ( $\chi^2=38.2$ , df =3,  $P < 0.001$ ), and no yoga practicing and overweight/obesity ( $\chi^2=8.09$ , df =1,  $P < 0.05$ ).

### DISCUSSION

In the present study, 20.26% had overweight and obesity. Laxmaiah A et al conducted a study among adolescents in Hyderabad and they found prevalence of overweight of 6.1% in boys and 8.2% in girls; prevalence of obesity was 1.6 and 1.0%, respectively.<sup>8</sup> According to a report by The National Nutrition Monitoring Bureau Surveys the prevalence of overweight among urban adolescent was 10 times higher than rural adolescents.<sup>9</sup> A study done by Kaur S et al amongst adolescent obese children, found that the prevalence of

overweight was (26%) and obesity (7.4%) among the adolescent studied in Delhi and Ludhiana.<sup>10</sup>

### Vegetable Consumption

Low intake of vegetable foods was an important contributory factor for over-nutrition. A study done by Gupta et al., in Bengal found that 84.29% adolescents were consuming vegetables among rural area.<sup>11</sup>

### Fruit Consumption

There was a significant association between less consumption of fruit and the occurrence of overweight/obesity in the adolescents. Yusuf et al., showed that abnormal lipids, tobacco, hypertension; diabetes, abdominal obesity; psychosocial factors; consumption of fruits, vegetables and regular physical activity were the major risk factors.<sup>12</sup>

### Role of Yoga and physical activity

In this study, we found that there no yoga practice and physical inactivity were related with the occurrence of overweight/obesity in the adolescents. Perez A et al in their study found that less physical activity is serious risk for the development of obesity.<sup>13</sup>

### Smoking

Smoking was not significantly associated with the obesity in the present study. In a review of 19 studies, Potter et al., noted a positive relationship between smoking and body weight among adolescents,<sup>14</sup> yet others did not find a positive association.<sup>14,15,16,17</sup>

### Study limitations

Larger sample size could have provided more vital information, however due to constraint of time the same could not be achieved. Presence of family members during interview could not be avoided and it might have influenced the response of the study subjects.

### CONCLUSION

Preventive healthcare strategies need to be clearly formulated and tested. Behaviour change communication supported by the screening is important for early detection to prevent complications. Community based studies are required to highlight the problem of obesity among urban adolescents by a comprehensive approach.

### REFERENCES

1. Agrawal S Basannar, Kushwaha A S. et al, Text Book of Public Health and Community Medicine, Department of Community Medicine AFMC Pune, 2009, Chapter 147 Adolescent Health, 858-867
2. Park K. Preventive Medicine in Obstetrics, Paediatrics and Geriatrics. In: Park K, editor. Park's Textbook of Preventive and Social Medicine. 23rd edn. Jabalpur: M/s Banarsidas Bhanot 2011
3. de Onis M, Onyango AW, Borghi E, Siyam A, Nishida C, Siekmann J. Development of a WHO growth reference for school-aged children and adolescents. Bull World Health Organ. 2007;85:660-7
4. Chakraborty P, Dey S, Pal R, Kar S, Zaman FA, Pal S. Obesity in Kolkata children: Magnitude in relationship to hypertension. J Nat Sc Biol Med. 2011;2:101-6.

5. Indian Council of Medical Research. Nutrient Requirement and Recommended Dietary Allowances for Indians, National Institute of Nutrition, Hyderabad, 2010
6. Singh AK, Maheshwari A, Sharma N, Anand K. Lifestyle associated risk factors in adolescents. Indian J Pediatr. 2006;73:901-6.
7. Geneva: WHO; Diet, physical activity and health. 2002 (documents A 55/16 and 55/16 Corr.1)
8. Laxmaiah A, Nagalla B, Vijayaraghavan K, Nair M. Factors affecting prevalence of overweight among 12 to 17 year-old urban adolescents in Hyderabad, India. Obesity (Silver Spring) 2007;15:1384-90.
9. National Nutrition Monitoring Bureau. Diet and Nutritional Status of Rural Population. Hyderabad, India: National Institute of Nutrition, Indian Council of Medical Research; 2002.
10. Kaur S, Kapil U, Singh P. Pattern of chronic diseases amongst adolescent obese children in developing countries. Curr Sci. 2005;88:1052-6.
11. Gupta A., Sarker G, Das P, Shahnawaz k, Pal R. Prevalence of lifestyle associated cardiovascular risk factors among adolescent students of rural Bengal. J Integrated Health Sci. 2013;1:69-75.
12. Yusuf S, Hawke S, Onupuv S, Danes T, Avenue A, Lamas F, et al. INTERHEART Study Investigators. Effect of potentially modifiable risk factors associated with myocardial infarction in 52 countries: Case control study. Lancet. 2004;364:937-52
13. Perez A, Hoel Dm, Springer AE, Brown HS, Barraso CS, Kelder SH, Castrucci BC. Physical activity, watching television, and the risk of obesity in students, Texas, 2004-2005. Prev Chronic Dis. 2011;8:61-61
14. Potter BK, Pederson LL, Chan SS, Aubut JA, Koval JJ. Does a relationship exist between body weight, concerns about weight, and smoking among adolescents? An integration of the literature with an emphasis on gender. Nicotine Tob Res. 2004;6:397-425.
15. Al-Kloub ML, Al-Hassan MA, Froelicher ES. Predictors of obesity in school-aged Jordanian adolescents. Int J Nurs Pract. 2010;16:397-405.
16. Yngve A, De Bourdeaudhuij I, Wolf A, Grjibovski A, Brug J, Due P, et al. Differences in prevalence of overweight and stunting in 11-year olds across Europe: The Pro Children Study. Eur J Public Health. 2008;18:126-30.
17. Curry C, Gabhainn SN, Godeau E, Roberts C, Smith R, Currie D, Picket W, Richter M, Morgan A, Barnekow V. WHO Regional Office for Europe. Copenhagen, Denmark: 2008. Inequalities in Young People's Health: HBSC International Report from the 2005/2006 Survey.

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