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Increasing level of overweight and obesity among adolescent school girls: A randomized trial

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Abstract
Worldwide, obesity trends are causing serious public health concern in adolescent girls. The aim of the study was to know the prevalence of obesity among adolescent school girls (15-17 yrs). Cross-sectional study was carried out over a period of four months on 400 girls of age 15-17 years adolescent girls from five girls of school of Patna. Samples were selected by purposive sampling. Data were collected by using predesigned, pre-tested, semi-structured interview schedule. Anthropometric measurements were recorded using standardized methodology as recommended by World Health Organization. Overall 23 per cent of adolescent girls were above the normal Body Mass Index (BMI) (overweight-12.25% and obese-10.75%). Main factors which was responsible for prevalence of obesity among adolescent girls were long duration exposure to TV, android phone and computer, sedentary life style, and poor quality of diet that is rich in junk foods, processed foods, chocolates and cold drinks etc.

Keywords: Adolescent girls, overweight, obesity, BMI

Introduction
Adolescent girls form an important vulnerable section of population that constitute about one tenth of Indian population. Obesity, like other malnutrition states, is known to impair immune function by altering leukocyte count as well as cell-mediated responses and causes organ damage. Not only is it causing physiological repressions, but it has significant psychological manifestations-that can damage intellect and personality. Obesity are important determinants of health leading to adverse metabolic changes and increases the risk of non-communicable diseases. Worldwide, obesity trends are causing serious public health concern and, in many countries, threatening the viability of basic health care delivery. It is an independent risk factor for cardiovascular diseases and significantly increases the risk of morbidity and mortality. The last two decades have witnessed an increase in health care costs due to obesity and related issues among adolescent girls.

At present the potential public health issue that is emerging is the increasing incidence of adolescent obesity in developing countries, and the resulting socioeconomic and public health burden that will be faced by these countries in the near future. The prevalence is higher in the urban than in the rural areas. Many studies have shown that the prevalence of overweight among adolescents varies between 10 and 30% (Subramanyam *et al.*, 2003) [1]. "Obesity is of particular concern for our children, since overweight adolescents have a 70% chance of becoming overweight or obese adults" (Cole *et al.*, 2008) [2]. With that alarming fact, the health risks associated are devastating. The following are some health risks associated with obesity in adolescents: (a) Type 2 diabetes, (b) cardiovascular disease, (c) advance maturation, (d) asthma, (d) gastrointestinal, (e) psychological problems (f) PCOD (Polycystic Ovarian Disease), (g) Hypothyroidism. Obesity in teen girls may lead to Depressive Symptoms (Lorna *et al.*, 2012) [3], it can also cause psychological distress, isolation, low self-esteem, and negative self-image

There are several causes of adolescent obesity. The main reasons for adolescent obesity in girls are – overeating, less activity or inactivity and excess TV viewing, sitting in front of computers and video games. If a teen eats and drinks more than the body needs, the excess energy stores in the form of body fat and, added to this, if the teen is not doing enough regular exercise, it worsens the problem. Many studies have shown that, adolescent girls, who have a television in their bedrooms, have the tendency to watch it more.

This leads to inactivity, the main culprit of teenage obesity.

Objective

The aim of the study was to know the prevalence of overweight and obesity among adolescent school girls (15-17yrs) in urban Patna.

Review of Literature

Seema *et al*. (2021) [4] described in their study that there is significant association of gender, socioeconomic status, dietary habits, chocolate eating habits, mode of transportation to school, sports participants, physical activity, and screen time. The teens who watched more than 2 h of screen time were more obese, and these were only a few reasons that were responsible for teenage obesity. Science Daily (2019) [5] reported that more cell phone and television use, a more sedentary lifestyle, and a decrease in physical activity may be risk factors for teenage obesity.

Payab *et al*. (2015) [6] depicted in their studies that despite established evidence of the negative impacts of junk foods on the human body, the consumption of junk foods is popular among youngsters. Such consumption may lead to a high prevalence of obesity, diabetes mellitus, hypertension, and coronary heart disease. Numerous health risks have been associated with adolescent overweight, including hypertension, respiratory disease, several orthopaedic disorders, diabetes mellitus and elevated serum lipid concentrations.

Ertz and Le Bouhart (2022) [7] reported in his studies that junk food contains high levels of saturated fats, trans-fatty acids, and refined sugar, which is the underlying cause of obesity and affects the body physically, psychologically, and socially. Barber *et al*. (2006) [8] explained in their research that PCOS is a serious and frequently prevalent obesity-related co-morbidity that manifests in girls and women genetically prone to it.

Materials and Methods

Study design, study population and sample size

A population-based cross-sectional study was conducted in Patna, Bihar, over a period of four months January to April 2023, on 400 girls of age 15-17 years (10+2 students) from five girl's school of Patna. Permission from the School Authority was obtained for conducting the study. Samples were selected by purposive sampling. Data was collected by interviewing the girls using predesigned, pre tested, semi-structured Interview schedule. Anthropometric measurements were recorded by using standardized methodology as recommended by World Health Organization.

Study instruments

Pre-designed, pre-tested, semi-structured questionnaire, Weighing machine, measuring tape, stadiometer, etc.

Body Mass Index (BMI)

BMI was calculated using the formula [BMI =Weight (in kg)/height^2 (in m)]. The girls were categorized into Various grade based on BMI according to WHO International Standard (WHO report, cole *et al*., 2008) [9, 2]. Normal BMI18.5-22.99 kg/m^2), Overweight (BMI 23-- 24.99 kg/m^2) and Obese (BMI >25 kg/m2) (WHO, report1998) [10].

Analysis of data

Data were analyzed using computer software Microsoft Excel for windows and all results were evaluated statistically by applying the SPSSPC package (version 9.0, SPSS, Chicago, Illinois, USA.). Data were presented as percentages for qualitative variable. Qualitative variable mean and Standard deviation were calculated. The association between prevalence of overweight and obesity was examined by a comparison among adolescent girls by using the Chi –square test.

Results and Discussion

A total of 400 adolescents in the age group of 15 to 17 years were analyzed to know the level of obesity (Table-1). The mean BMI of overweight adolescent girls were 24.48±.47, obese I (27.45±1.18) and obese II (32.77±1.95). BMI of 52.5 per cent adolescent girls was normal while 24.5 per cent was underweight. Overall 23 per cent of adolescent girls were above the normal BMI (overweight-12.25% and obese-10.75%).

Table 1: Mean Body Mass Index (BMI) of adolescent girls (N-400)

Indicators	Adolescent girls	Mean BMI ±SD
Underweight (<18.5)	98	17.98±.64
Normal (18.5 – 22.9)	210	22.15±1.24
Overweight (>23.0 -24.9)	49	24.48±.47
Obese I (>25.0 -29.9)	39	27.45±1.18
Obese II (>30.0)	4	32.77±1.95

Prevalence of obesity among adolescent girls and its relation with socioeconomic status, exposure to TV, android phone and computer, physical activity and diet preferences were presented in Figure-1.

Risk of overweight was highest in the adolescent girls of high-income group (more than 4 times of normal) followed by middle income group and same pattern for obesity. The main cause behind the overweight and obesity was sedentary lifestyle of adolescent girls; more than 50 per cent of girls were not doing any physical activity or very less activity. They were not playing outdoor games for fitness and the main culprit for this was TV, android phone and computer. Majority of girls were spending their maximum time in watching TV, android phone and in computer operation even more than 4 hours.

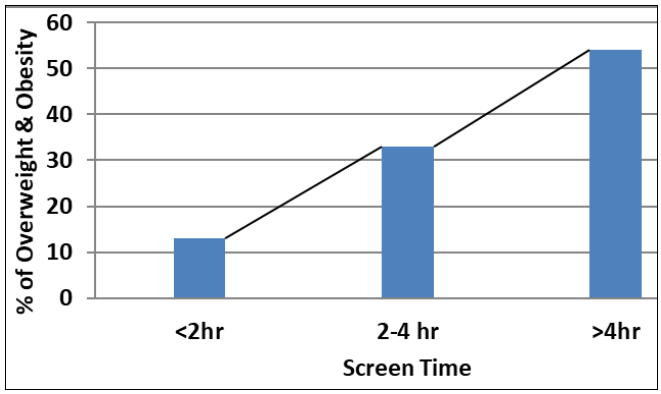

Fig 1: Screen time exposure by adolescent girls (TV watching, computer and android phone operation

Another most important cause behind overweight and obesity was poor dietary lifestyle

which was prominently present among adolescent girls. More than 70 per cent of adolescent girls were taking junk foods, chocolates, cold drinks. Factors responsible for overweight and obesity were statistically non significant (p>.05) Table 2 itself reflecting all these factors.

Table: 2: Prevalence of overweight and obesity according to its determinants (N-400)

Determinants	Number of Girls	Number of Overweight girls (Prevalence in%)	Number of Obese girls (Prevalence in %)	$\chi 2$	P-Value
Adolescent girls	400	49(12.25)	43(10.75)	0.49	0.824
Age (In complete years)					
15	110	17(15.45)	13(11.82)	0.549	0.458
16	160	15(9.37)	17(10.625)		
17	130	17(13.078)	13(10.0)		
Socioeconomic Status					
LIG	79	3(3.79)	0(0)	0.607	0.436
MIG	161	17(10.55)	19(11.80)		
HIG	160	29(18.25)	24(15)		
Physical activity (Games & Sports)					
None & >30min	223	45(20.18)	42(18.83)	0.027	
30min-1hr	119	4(3.36)	1(0.84)		
>1hr	58	0(0)	0(0)		
Diet preferences					
Normal	87	1(1.14)	0(0)	0.607	0.436
Junk food and processed food	216	33(15.28)	31(14.35)		
Sweets and chocolates	97	15(15.44)	12(12.37)		

Obesity in adolescents has raised to significant levels globally with serious public health consequences. A similar study was done in Hyderabad showed that the prevalence of overweight was 7.2% among the 12 to 17 year age group (Laxmaiah *et al.*, 2007) [12] Although, some other studies done in India showed a higher prevalence of overweight and obesity (Chatterjee, 2002 and, 2005; Khadilkar, 2004) [13, 14]. A study in Delhi on affluent school children showed the prevalence of obesity to be 7.4% (Kapil, 2002) [15]. Another study among affluent girls in Delhi reported the prevalence of obesity and overweight to be 5.3 and 15.2%, respectively (Mehta *et al*, 2007) [16]. High consumption of Junk Foods contributes to the overweight among School-aged children in India from 9.7% to 13.9% over a decade (Ranjani *et al*., 2016) [17] Similar studies had been conducted to assess the prevalence of overweight and obesity in India and the results are comparable to our study, with respect to the prevalence of obesity. Encouraging diets with recommended quantities of fruits and vegetables have been supported by mixed evidence. Healthy behaviours derived from this evidence include consuming a balanced diet rich in calcium and fiber, moderate to vigorous physical activity per day and limiting consumption of energy dense foods (junk food). In addition to cardiovascular, emotional and social issues, it poses a serious hazard to the basic health care delivery system. Unless this epidemic is contained at a war footing, the implications of this global phenomenon on future generations will be serious. Zhu *et al*. (2019) [18] investigated on the current situation and influencing factors on consuming junk foods among children and adolescents in Beijing city. He used a questionnaire survey method to survey the junk food habits and their effects. One month before the survey, all individuals have an intake of one type or the other junk foods. Mostly they didn't have an understanding of nutrition, and mostly they have misunderstandings about nutritional value and effect on the human body.

Conclusion

Overweight and obesity in adolescents became serious public health problem. Overall 23 per cent of adolescent girls were above the normal BMI (overweight-12.25% and obese-10.75%). It is an independent risk factor for cardiovascular diseases and significantly increases the risk of morbidity and mortality. The main cause behind the overweight and obesity was sedentary lifestyle (more than 50%), avoiding physical activity and giving maximum time on TV watching and computer operation and diet rich in calories (junk foods, processed foods, chocolates and cold drinks)

A holistic approach to tackle the adolescent obesity epidemic needs a collection of activities including influencing policy makers and legislation, mobilizing communities, restructuring organizational practices, establishing coalitions and networks, empowering providers, imparting community education as well as enriching and reinforcing individual awareness and skills. The implications of this global phenomenon on future generations will be serious unless appropriate action is taken. mediated through the risk of metabolic syndrome.. Thus, a combination of junk food, physical inactivity, and constant psychological stressors on children and adolescents during the pandemic makes them more vulnerable to increased weight along with decreased Immunity

There is an urgent need to spread awareness among children and young adults about these adverse effects of junk food. There is no better time than now to build a supportive environment nurturing children and young adults in society and promising good health.

References

1. Subramanyam V, Jaya Shree R, Rafi M. Prevalence of overweight and obesity in affluent adolescent girls in Chennai in 1981 and 1998. Indian Pediatr. 2003;40:332-6.
2. Cole TJ, Bellizzi MC, Flegal KM, Dietz WH. Establishing a standard definition for child overweight and obesity worldwide: International survey. BMJ. 2008;320(7244):1240-1243.
3. Fraser LK, Clarke GP, Cade JE, Edwards KL. Fast Food and Obesity: A Spatial Analysis in a Large United Kingdom Population of Children Aged 13–15. Am. J Prev. Med. 2012;47(5):e77-e85.
4. Seema S, Rohilla, Kusum K, Kalyani Vasantha C, Prerna P. Prevalence and contributing factors for adolescent obesity in present era: Cross-sectional Study. J Fam Med Prim Care. May 2021;10(5):1890-1894. DOI: 10.4103/jfmpc.jfmpc_1524_20.
5. World Health Organization. Nutritional status of adolescent girls and women of reproductive age. Report of Regional consultation, Geneva, World Health Organization, SEA / NUT/141; 1998.
6. Payab M, Kelishadi R, Qorbani M, Motlagh ME, Ranjbar

SH, Ardalan G, *et al*. Association of junk food consumption with high blood pressure and obesity in Iranian children and adolescents: the Caspian-IV Study. Jornal de Pediatria (Versão em Português). 2015;91:196–205. Doi:10.1016/j.jpedp.2014.07.008.
7. Ertz M, Le Bouhart G. The Other Pandemic: A Conceptual Framework and Future Research Directions of Junk Food Marketing to Children and Childhood Obesity. J Marketing. 2022;42(2):1-21.
8. Brial F, *et al*. Diet-dependent impact of benzoate on diabetes and obesity in mice. Biochimie; c2022.
9. Bohlouli J, Moravejolahkami AR, Ganjali Dashti M, Balouch Zehi Z, Hojjati Kermani MA, Borzoo-Isfahani M. COVID-19 and fast foods consumption: a review. Int J Food Prop. 2021;24(1):203–209. doi: 10.1080/10942912.2021.1873364.
10. World Health Organization. WHO Report 1998.
11. World Health Organization. WHO Report 2008.
12. 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.
13. Chatterjee P. India sees parallel rise in malnutrition and obesity. Lancet. 2002;360:1948.
14. Khadilkar VV, Khadilkar AV. Prevalence of obesity in affluent school boys in Pune. Indian Pediatr. 2004;41:857-8.
15. Kapil U, Singh P, Pathak P, Dwivedi SN, Bhasin S. Prevalence of obesity among affluent adolescent school children in Delhi. Indian Pediatr. 2002;39:449.
16. Mehta M, Bhasin SK, Agrawal K, Dwivedi S. Obesity among affluent adolescent girls. Indian J Pediatr. 2007;74:619-22.
17. Ranjani H, Mehreen TS, Pradeepa R, Anjana RM, Garg R, Anand K, *et al*. Epidemiology of childhood overweight & obesity in India: A systematic review. Indian J Med Res. 2016;143:160–174. doi: 10.4103/0971-5916.180203.
18. Zhu Y, Bo Y, Liu Y. Dietary total fat, fatty acids intake, and risk of cardiovascular disease: A dose-response meta-analysis of cohort studies. Lipids Health Dis. 2019;18(1):91. Doi:10.1186/s12944-019-1035-2.
19. Gortmaker SL, Dietz WH Jr., Cheung LW. Inactivity diet and the fattening of America. J Am. Diet. Assoc. 1990;90:1247-1255.