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Comparative study of overweight and obesity among government and private school children in Guntur

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Introduction: Various studies conducted in India indicate a rising trend in the prevalence of overweight and obesity in children. This alarming rise in childhood obesity is often attributed to increased intake of high calorie foods, coupled with decreased physical activity. Obesity is also a major risk factor for Non Communicable diseases like Diabetes Mellitus, Cardiovascular diseases and Cancer. **Methods:** A school based cross sectional study was conducted in three government and three private schools among children enrolled in 6^{th} to 10^{th} standard. Information regarding consumption of fruits / week, junk food, intake of carbonated drinks, and time spent on viewing of television and physical activity was collected by using a predesigned and pretested questionnaire. Body Mass Index (BMI) was calculated by using the formula, BMI= Weight in kilograms / (Height in meter)^2 . **Results:** The mean age of study participants was 13.2 ± 1.19 years. Information was collected from a total of 1043 school children studying 6^{th} to 10^{th} class of which 495 (47.45%) and 548 (52.54%) were enrolled in government and private schools respectively. Among government school children the consumption of carbonated drinks (55.75%) and junk foods (80.6%) was significantly higher when compared to private school children (36.49% and 68.06% respectively). **Conclusion:** Several risk factors are prevalent among government and private school children. Early detection of the risk factors and timely interventions are needed to prevent their progression to overweight and obesity in future. Simple strategies involving health and nutrition education and physical activity could go a long way in preventing overweight and obesity and their consequences.

Keywords: Nutritional Risk Factors, Obesity, Overweight, School children

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Introduction

Obesity has emerged as one of the global health problems. Worldwide 200 million school aged children were categorized as being overweight/obese, of which 40-50 million are obese [1]. Various studies conducted in India in the recent past also indicate a rising trend in the prevalence of overweight and obesity in children and adolescents ranging from 3- 29 % [2-5]. This alarming rise in childhood obesity is often attributed to increased intake of high calorie foods, coupled with decreased physical activity [6]. The roots of obesity can be traced to childhood, in that 30% of obesity begins in childhood and out of them 50 – 80% become obese adults [7].

The health consequences of obesity are variable ranging from an increased risk of premature death to affecting the quality of life of an individual. Obesity is also a major risk factor for Non Communicable diseases like Diabetes Mellitus, Cardiovascular diseases and Cancer. It is also associated with hyperlipidemias and hypertension [8]. Assessment of risk factors among school children can be important in understanding the magnitude of the problem of overweight / obesity and provides an opportunity for early initiation of preventive measures. The present study aims to find out the magnitude and risk factors for overweight and obesity among school children attending government and private schools.

Material and Methods

Study design: Cross sectional study

Study setting: Three government and three private schools were selected by simple random sampling from the available list of government and private schools in Chilakaluripet town of Guntur district.

Study period: August to November 2015.

Study participants: Students studying 6th to 10th class in the randomly selected government and private schools.

Inclusion Criteria: All students from selected schools present on the day of the visit and willing to participate in the study after obtaining informed consent from the parents.

Exclusion Criteria: Students whose parents have not given consent for participating in the study and those absent on the day of visit were excluded.

Data Collection: Data was collected by using a predesigned and pretested questionnaire after obtaining permission from Institutional ethics committee and from principals of selected schools. Informed consent from the parents and assent from school students were taken.

Information on socio demographic variables and individual characteristics like consumption of fruits / week, junk food, intake of carbonated drinks, and time spent on viewing of television and physical activity were also collected.

Study sample: Information was obtained from a total of 1043 school children studying in government and private schools.

Study Variables: Junk food and carbonated drinks consumption was considered "yes" if it was more than three times a week. Similarly regular physical activity was considered "yes" when outdoor and indoor playing was >30 min/day. Height was measured by stadiometer to the nearest centimeter without shoes. Weight was measured with light clothing and without shoes to the nearest 100 grams.

Body Mass Index (BMI) was calculated by using the formula, **BMI= Weight in kilograms / (Height in meter)2**. Overweight and obesity were categorized by ELIZ Health Pathway for Adolescents, where BMI <15 kg/m2 was considered as Underweight / Chronic Energy Deficiency, 15 to 22 kg/m2 as Normal, >22 to 25 kg/m2 as Overweight and BMI >25 kg/m2 as Obesity [9].

Statistical Methods: Data analysis was done using SPSS version 20. Variables were expressed in proportions and compared using Chi square test. *P* value of <0.05 was considered statistically significant.

Results

Information was collected from a total of 1043 school children studying 6th to 10th class of which 495 (47.45%) and 548 (52.54%) were enrolled in government and private schools respectively (Table 1).

Table-1: Distribution of study participants by gender and type of school

Type of School	Gender		Total
	Females	Males	
Government	293(59.2)	202(40.8)	495(100.0)
Private	240(43.8)	308(56.2)	548(100.0)

The mean age of study participants in our study was 13.2 ± 1.19 years.

The dietary risk factors like decreased intake of Fruits, consumption of carbonated drinks and junk food were significantly higher among government school children in comparison to children of private schools (Table 2).

Table -2: Risk Factors among students of government and private schools

Risk factors	Government schools (n = 495) (%)	Private schools (n = 548) (%)	p value
Fruit consumption ≤3 times/week	233(47.07)	184(33.57)	c2 = 19.37 p < 0.0001*
Vegetable consumption ≤3 times/week	113(22.82)	104(18.97)	c2 = 2.34 p >0.05
Carbonated drinks ≥3 times/week	276(55.75)	200(36.49)	c2 = 38.89 p < 0.0001*
Junk Food consumption ≥3 times/week	399(80.6)	373(68.06)	c2 = 21.26 p < 0.0001*
No Physical activity	136(27.4)	190(34.67)	c2 = 6.26 p < 0.05*
Watching Television >3hours/day	160(32.3)	152(27.73)	c2 =2.61 p >0.05

*Significant

Nutritional status was categorized by ELIZ Health Pathway for Adolescents (EPHA).It was observed that 16.58% of school children were overweight/obese. The proportion of overweight was 10.5% (4% and 16.2% in government and private schools, respectively) and obesity was 6.1% (1.8% and 10% in government and private schools, respectively.

The prevalence of overweight / obesity among private school children (26.2%) was significantly higher than government schools (5.8%) (c^2 =78.37; P<0.0001). (Table 3)

Table-3: Nutritional status of school children by type of school and gender

BMI (kg/m2)	Government schools (n = 495)			Private schools (n = 548)		
	Females	Males	Total (%)	Females	Males	Total (%)
<15	62	61	123(24.8)	16	36	52 (9.5)
15 to 22	210	133	343(69.3)	154	198	352(64.2)
>22 to 25	17	3	20(4.0)	36	53	89(16.2)
>25	4	5	9(1.8)	34	21	55(10.0)

Discussion

Childhood obesity is one of the most serious public health challenges of the twenty first century. The proportion of children in the general population who are overweight and obese has doubled over the past two decades in both developed and developing countries [10].

This increase in the prevalence of overweight and obesity among children has been reported in several studies conducted in India [11-17].

Dietary habits play an important role in development of overweight and obesity. Rapid urbanization and globalization of the food market resulted in more widespread availability of fast-food shops and changes in dietary habits, with families and individuals increasingly eating outside the home leading to increased consumption of junk food or fast foods [18 -20].

Eating fruit during adolescence, in place of foods high in fat, sugar and salt, can protect against health problems such as obesity, diabetes, and cardiovascular diseases. Moreover, eating fruit and vegetables when young can be habit forming, promoting healthy eating in adult life [21].Fruits and vegetables consumption is an essential component of a balanced diet.

In the present study 47.07% of government school children and 33.57% of private school children reported inadequate fruit consumption i.e ≤3 times / week (p<0.0001).Studies done in similar settings reported fruit consumption among private school children (62.1% were taking fruits ≤ 3times / week) to be much lower than that reported in our study [22].

Consumption of vegetables less than 3 days per week was reported by 22.82% of government and 18.97% private school students respectively.

These findings are in contrast to those reported from similar study done in Mangalore city where 17.1% of students from government school and 25.6% private school students took vegetables less than 3 days per week [23]. How ever there was no significant difference among government and private school children in the present study.

Among government school children the consumption of carbonated drinks (55.75%) and junk foods (80.6%) was significantly higher when compared to private school children (36.49% and 68.06% respectively). Similar trends regarding junk food consumption among government and private school children have been reported in the study done in Mangalore [23].

However the findings of the present study are much higher in comparison to the study done among school children in Mangalore where junk food consumption ≥3 times/week has been reported by 56.9% of government and 29% of private school students.

Urbanization is associated with increased sedentary behavior and lack of physical activity among children due to lack of play grounds, hence more time is spent watching television and playing computer games[5].Various studies reported that reduced physical activity and watching television for longer duration were associated with obesity among children [24,25].

In the present study, the proportion of government and private school children without any physical activity were 27.4% & 34.67% respectively ($c2 = 6.26; p < 0.05$).Television viewing (> 3hrs) were reported by 32.3% and 27.73% of government and private school children ($p>0.05$). This is similar to the findings reported by studies done among school children in an urban area of Guntur [22].

Various studies conducted from different parts of India have reported the prevalence of childhood and adolescent obesity and overweight ranging from 3% to 29%, and also indicated that the prevalence is higher in urban than in rural areas [26]. Another multi centric study reported an overall prevalence of overweight/obesity as 18.2% [13]. School based studies on obesity in India shows a prevalence of 5.6-24% among children and adolescents [14]. These studies have been done by using different criteria for grading of overweight and obesity. A meta-analysis on childhood obesity in India has shown the prevalence of overweight as 12.6% and obesity as 3.4% [27].

The combined prevalence of overweight and obesity among both government and private schools in the present study was 16.12%. The prevalence of overweight / obesity among private school children (26.2%) was significantly higher than government schools (5.8%). These findings of private schools are much higher than those reported by similar studies [22].

However in government schools the findings are lower than those reported by similar studies done in other parts of India [24, 28]. In the present study, among both government and private schools significantly higher proportions of girls were in the category of overweight and obesity. These findings are similar to those reported by earlier studies done in South India [29, 30]. Few studies, however reported boys to be having a higher prevalence of overweight than girls [10,12,19].

The consumption of carbonated drinks and junk foods was significantly higher among government school children and overweight and obesity were more in private school children. It may be due to recent change in the food habits and their effects can become evident over course of time.

A study done among school children in North East India reported that the study failed to show any significant association between the prevalence of obesity and consumption of junk food [31]. In addition to this, less number of private school children was involved in physical activities like playing outdoor games. Besides food intake habits, these exercise factors may also have an influence on overweight and obesity.

Moreover, there might have been a recent change in the dietary habits of private school children due to any nutritional awareness campaigns, which could not be ascertained due to the cross sectional type of study.

Conclusion

In the present study, the prevalence of overweight and obesity were higher among private school children when compared to government school children. However risk factors for over nutrition like decreased fruit consumption, increased consumption of carbonated drinks and junk food were higher in government school children.

Early detection of the risk factors and timely intervention are key steps in preventing their progression to overweight and obesity in future.

Simple strategies involving health and nutrition education, and increased physical activity could go a long way in preventing overweight and obesity and their consequences.

Reference

01. International Association for the Study of Obesity. Obesity the Global Epidemic.
Available from: [Article] [Crossref]

02. Ramachandran A, C Snehalatha, R Vinitha, Megha Thayyil, C K Sathish Kumar, L Sheeba, S Joseph, V Vijay. Prevalence of overweight in urban Indian adolescent school children. Diabetes Res Clin Pract. 2002;57(3)185-90.
[Crossref]

03. Khadilkar VV, Khadilkar AV. Prevalence of obesity in affluent school boys in Pune. Indian Pediatr. 2004;41(8)857- 8.
[Crossref]

04. Sharma A, Sharma K, Mathur KP. Growth pattern and prevalence of obesity in affluent schoolchildren of Delhi. Public Health Nutr. 2007;10(5)485-91.
[Crossref]

05. Kotian MS, Kumar SG, Kotian SS. Prevalence and determinants of overweight and obesity among adolescent school children of South Karnataka, India. Indian J Community Med. 2010;35(1)176-8.
doi: 10.4103/0970-0218.62587 [Crossref]

06. Kaushik JS, Narang M, Parakh A. Fast food consumption in children. Indian Pediatr. 2011;48(2)97-101.
[Crossref]

07. WHO Technical Report Series 894 Obesity. Preventing and Managing The Global Epidemic. World Health Organization- Geneva, Switzerland. 2000.
[Crossref]

08. Venkatnarayan KM, Campagna AF, Imperatore G. Type2 diabetes in children- A problem lurking from India?. Indian Pediatr. 2001;38(7)701.
[Crossref]

09. Elizabeth KE. A novel growth assessment chart for adolescent. Indian Pediatr. 2001;38(7)1061-4.
[Crossref]

10. Raj M, Sundaram KR, Paul M, Deepa AS, Kumar RK. Obesity in Indian children- time trends and relationship with hypertension. Natl Med J India. 2007;20(6)288-93.
[Crossref]

11. Misra A, Shah P, Goel K, Hazra DK, Gupta R, Seth P, et al. The high burden of obesity and abdominal obesity in urban Indian schoolchildren- a multi centric study of 38,296 children. Ann Nutr Metab. 2011;58(3)203-11.
doi: 10.1159/000329431 [Crossref]

12. Jeemon P, Prabhakaran D, Mohan V, Thankappan KR, Joshi PP, Ahmed F, et al. SSIP Investigators, Double burden of underweight and overweight among children (10-19 years of age) of employees working in Indian industrial units. Natl Med J India. 2009;22(4)172-6.
[Crossref]

13. Khadilkar VV, Khadilkar AV, Cole TJ, Chiplonkar SA, Pandit D. Overweight and obesity prevalenc e and body mass index trends in Indian child ren. Int J Pediatr Obes. 2011;6(2-2)e216-24.
doi: 10.3109/17477166.2010.541463 [Crossref]

14. Kapil U, Singh P, Pathak P, Dwivedi SN, Bhasin S. Prevalence of obesity amongst affluent adolescent school children in delhi. Indian Pediatr. 2002;39(5)449-52.
[Crossref]

15. Jain S, Pant B, Chopra H, Tiwari R. Obesity amo ng adolescents of affluent public schools in Mee rut. Indian J Public Health. 2010;54(3)158-60.
doi: 10.4103/0019-557X.75740 [Crossref]

16. Sharma A, Sharma K, Mathur KP. Growth patter n and prevalence of obesity in affluent schoolchi ldren of Delhi. Pub Heal Nutr. 2007;10(5)485-91
[Crossref]

17. Patnaik S, Patnaik L, Patnaik S, Hussain M. Prevalence of overweight and obesity in a private school of Orissa, India. Internet J Epidemiol. 2010;10(1)1–4.
[Crossref]

18. Goyal RK, Shah VN, Saboo BD, Phatak SR, Shah NN, Gohel MC, et al. Prevalence of overweight and obesity in Indian adolescent school going children- its relationship with socioeconomic status and associated lifestyle factors. J Assoc Physicians India. 2010;58;151-8.
[Crossref]

19. Goyal JP, Kumar N, Parmar I, Shah VB, Patel B. Determinants of Overweight and Obesity in Affluent Adolescent in Surat City, South Gujarat region, India. Indian J Community Med. 2011;36(4)296-300.
doi: 10.4103/0970-0218.91418 [Crossref]

20. Vohra R, Bhardwaj P, Srivastava JP, Srivastava S, Vohra A. Overweight and obesity among school-going children of Lucknow city. J Fam Community Med. 2011;18(2)59-62.
doi: 10.4103/2230-8229.83369 [Crossref]

21. OECD (2013). "Fruit and vegetable consumption among children", in Health at a Glance 2013-OECD Indicators. OECD Publishing, Paris. DOI: http://dx.
doi.org/10.1787/health_glance-2013-17-en
[Crossref]

22. Chaitanya G, Kasyapa V B, Ravinder A. Risk factors for Non Communicable Diseases (NCD) among High School Students in an Urban Setting. International Journal of Recent Trends in Science and Technology. 2013;7(2)82–5.
[Crossref]

23. Jain A, Dhanawat J, Kotian M S, Angeline R. Assessment of risk factors of non-communicable diseases among high school students in Mangalore, India. Int J Health Allied Sci. 2012;1(4)249-54.
DOI: 10.4103/2278-344X.107888 [Crossref]

24. 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(6)1384-90.
DOI: 10.1038/oby.2007.165 [Crossref]

25. Kuriyan R, Bhat S, ThomasT, Vaz M, Kurpad A V. Television viewing and sleep are associated with overweight among urban and semi-urban South Indian children. Nutr J. 2007; 6(25)1-4.
[Crossref]

26. Kaur S, Kapil U, Singh P. Pattern of chronic diseases amongst adolescent obese children in developing countries. Curr Sci. 2005;88(7)1052–56.
[Crossref]

27. Midha T, Nath B, Kumari R, Rao YK, Pandey U. Childhood obesity in India- a meta-analysis. Indian J Pediatr. 2012;79(7)945-8.
doi: 10.1007/s12098-011-0587-6 [Crossref]

28. Jain S, Pant B, Chopra H, Tiwari R. Obesity among adolescents of affluent public schools in Meerut. Indian J Public Health. 2010;54(3)158-60.
doi: 10.4103/0019-557X.75740 [Crossref]

29. Jagadesan S, Harish R, Miranda P, Unnikrishnan R, Anjana RM, Mohan V. Prevalence of overweight and obesity among school children and adolescents in Chennai. Indian Pediatr. 2014;51(7)544-9.
[Crossref]

30. Shabana T, Vijay V. Impact of socioeconomic status on prevalence of overweight and obesity among children and adolescents in urban India. The Open Obesity Journal. 2009;1(1)9-14.
[Crossref]

31. Bhattacharya PK, Gogoi N, Roy A. Prevalence and awareness of obesity and its risk factors among adolescents in two schools in a northeast Indian city. Int J Med Sci Public Health. 2016;5(6)1111-22.
[Crossref]