DOI: 10.7860/JCDR/2016/17624.7383

Original Article

Internal Medicine Section

Prevalence of Overweight and Obesity in 4 Schools of South Mumbai

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ABSTRACT

Introduction: The paediatric obesity is on the rise so as the complications of obesity like cardiovascular diseases, liver diseases, dyslipidaemia are increasing. The changing dietary habits and less of outdoor activities are risk factors for obesity.

Aim: The study was conducted to find out prevalence of overweight and obesity among students in four schools of the Mumbai and compare with studies from rest of the country.

Materials and Methods: It is school based, cross-sectional study conducted in four Schools from class of 5th to 10th. The anthropometric measurements of height, weight were taken of each student. The body mass index was calculated based on the age based Cole et al., criteria (International) as well as Khadilkar et al., criteria which are specially develop for Indian children. The data was analysed with chi-square test.

Results: Total 1828 students were screened from 4 schools. Out of which 590 were girls and 1238 were boys. The prevalence of overweight and obesity by Cole et al., criteria were 11.3% and 3.3% and by Khadilkar et al., criteria were 17.5% and 7.8 % respectively.

Conclusion: It shows significant difference in obesity between boys and girls and also between government and private schools. There is overall decrease in prevalence of overweight and obesity as age increases. The overweight and obesity among these schools in Mumbai is comparable with the rest of the studies from India.

Keywords: Body mass index, Childhood obesity, School

INTRODUCTION

The childhood obesity is increased more than three folds in last two decades in developed world [1]. There is nutritional transition seen in the developing world including India. The westernization in diet of the Indian population along with prosperity brings the brunt of overweight and obesity. This has future implications of liver diseases, heart diseases, hypertension, hyperlipidaemia, insulin resistance; malignancies. Mumbai is the prosperous city and an economical capital of India. Also, the rampant use junk food, common outdoor eating's, no grounds to play for children make the high likelihood that the prevalence of obesity to be higher than rest of the country. The present study was done in the 4 schools out of which two are government run and others are convent schools covering low to high socioeconomic status.

MATERIALS AND METHODS

The study was school based, cross-sectional study carried out from December 2014 to January 2015. The permission from the principal, parents and assent from the students were taken. The institutional ethics committee clearance was taken. The screening was done in the 4 schools, two governments and two convents from class of 5th to 10th. The height was measured with the stadiometer with heels of both feet together and the toes pointed slightly outward at approximately 60°angle. The body weight evenly distributed and with both feet flat on the floor. The heels, buttocks, back of the head remain in contact with the vertical backboard. The head maintained in the Frankfort horizontal plane. The height was measured when student takes deep breath [2]. The weight was measured with the electronic weighing machine with accuracy of 100 milligrams. The body mass index was calculated based on the age based Cole et al., criteria (International) [3] as well as Khadilkar et al., criteria which are specially develop for Indian children [4]. The team of specialty medical officer, post graduate resident, research assistant went with same instruments to all schools. The data was analysed with the chi-square test and proportions.

RESULTS

Total 1828 students were screened from 4 schools. Out of which 590 were girls and 1238 were boys. The prevalence of overweight and obesity by Cole et al., criteria were 11.3% and 3.3% respectively. The prevalence by Khadilkar et al., criteria was 17.5% and 7.8% respectively. The distribution among boys' and girls and their gender wise prevalence is given in the [Table/Fig-1].

	Cole et al., criteria		Khadilkar et al., Criteria	
	Overweight	Obese	Overweight	Obese
Boys	150 (12.1%)	51 (4.1%)	214 (17.2%)	113 (9%)
Girls	57 (9.6%)	11 (1.8%)	106 (17.9%)	30 (5%)
Government School	20 (3.8%)	3 (0.5%)	50 (9.6 %)	13 (2.5 %)
Private School	187 (14.2%)	59 (4.5%)	270 (20.6 %)	130 (9.9 %)

[Table/Fig-1]: Prevalence of overweight and obesity defined by Cole et al., and Khadilkar et al., criteria and categorized as boys v/s girls and government v/s private school.

Age (years)	Number of students	Cole et al., Criteria		Khadilkar et al., Criteria	
		Overweight	Obesity	Overweight	Obesity
9	168	21 (12.5%)	13(7.7%)	28 (16.7%)	24(14.2%)
10	250	31 (12.4%)	13(5.2%)	56 (22.4%)	22(8.8%)
11	248	30(12.1%)	5(2%)	37(14.9%)	22 (8.8%)
12	256	38 (14.8%)	9 (3.5%)	59 (23%)	22 (8.5%)
13	272	31 (11.3%)	8(2.9%)	47(17.2%)	17 (6.2%)
14	374	37 (9.8%)	6(1.6%)	62 (16.5%)	19 (5%)
15	260	19(7.3%)	8(3%)	31 (11.9%)	17 (6.5%)
Total	1828	207(11.3%)	62(3.3%)	320(17.5%)	143(7.8%)

[Table/Fig-2]: Prevalence of overweight and obesity as defined by Cole et al., and Khadilkar et al., criteria according to age.

It shows significant difference in obesity between boys and girls (For Indian criteria, p-value 0.002, CI 1.23 – 2.83, OR 1.87; For international criteria, p-value 0.004, CI 1.16 – 4.37, OR 2.26). There is no significant difference in overweight among them. The difference

in obesity and overweight between government and private schools is significant with either criterion applied (For obesity and overweight by Khadilkar et al., criteria p-value <0.001, CI 0.13-0.41, OR 0.233 and p-value <0.001, OR0.41, CI 0.29-0.56 respectively) (For obesity and overweight by Cole et al., criteria p-value <0.001, OR 0.12, CI 0.03- 0.39 and p-value <0.001, OR 0.24, CI 0.14 – 0.38 respectively). The agewise distribution of overweight and obesity is shown in [Table/Fig-2]. It shows overall decreasing trend as age advances.

DISCUSSION

This study shows prevalence of overweight and obesity slightly lower with the other studies from the metro cities of India like New Delhi [5] and Chennai [6] and higher than the study from the Karnataka [7]. Also, the prevalence is higher than overall global prevalence of obesity (10%) [8]. The calculation of prevalence using Khadilkar et al., criteria finds a large proportion of students which otherwise would have been missed by the international Cole et al., criteria [3]. The boys have statistically significant higher prevalence of obesity as compared with girls. There was no difference in prevalence of overweight between boys and girls. This is in contrast with the study from Chennai where they found overweight and obesity more in girls as compared with the boys [6]. The prevalence of overweight and obesity was significantly higher in private compared to government schools both by the international Cole et al., and Indian Khadilkar et al., criteria. This was similar to finding seen in study from Chennai [6]. The overall prevalence of overweight and obesity does not increase with the increasing age except for small increase at age 10 and 12 years.

According to World Health Organization, at least 2.8 million people die each year as a result of being overweight or obese [9]. A holistic comprehensive approach needed to tackle the obesity epidemic. It involves a mobilization from policy, community practices and strong knowledge base of dietary habits along with pictorial and videos of complications of obesity in school going children. The particular time should be allotted to physical education during school hours. The canteens of the schools should not give emphasis on fast foods only [10]. The correctable measures that can be taken at family levels are limiting sugar sweetened beverages, reducing daily television watching to less than two hours, removing television and computers from primary sleeping areas, Head of Deparment encouraging family meals and limiting serving sizes [11].

LIMITATION

The limitation of the study is small sample size. The number of girls was less as compared with the boys.

CONCLUSION

The study highlights the significant difference in obesity between boys and girls and also between government and private schools. There is overall decrease in prevalence of overweight and obesity as age increases. The overweight and obesity among these schools in Mumbai is comparable with the rest of the studies from India. The prevention is best strategy to prevent obesity and its complications. National level programs are needed for the control of obesity.

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FINANCIAL OR OTHER COMPETING INTERESTS: None.

Date of Submission: **Oct 31, 2015**
Date of Peer Review: **Nov 17, 2015**
Date of Acceptance: **Dec 16, 2015**
Date of Publishing: **Mar 01, 2016**