

Prevalence of Overweight and Obesity among School Children in Aurangabad City, Maharashtra, India.

Shilpa P. Khot* & U. K. Vairagade**

* Assistant Professor, Department of Home Science, Chishtiya Art's College, Khultabad, Maharashtra, INDIA.

** Associate Professor & H.O.D., Department of Home Science, Dr. I.B.P. Mahila College, Aurangabad Maharashtra, INDIA.

Corresponding E-mail ID – shiplap.khot@gmail.com

Research Article

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Abstract:

Nutritional status of the Indian population varies significantly across the region. Certain regions are associated with extremely high rates of childhood under nutrition, where as others have a high prevalence of childhood over nutrition. The present study was conducted to determine the prevalence of overweight and obesity in school going children, as it is critical period in life style of human beings. the aim of study is that To know the prevalence of overweight and obesity among school children of Aurangabad city.

Materials and Methods: A comparative cross-sectional study was conducted of 12 government and 12 private schools from different parts of city. Probability proportionate to size of population technique was used to decide number of children. Pre-designed and pre-tested questionnaire was used to elicit the information on demographic variables. Overweight & obesity were defined by using CDC growth charts. Data was analyzed using SPSS version 20.

Results: Prevalence of overweight and obesity was 7% and 3% respectively. Prevalence was more in the age group if 13-15 years (11.57%), and in private school children (11.43%). Prevalence of obesity and overweight in both gender was more or less same, but girls tend to be slightly overweight than boys.

Conclusion: Among 6000 children, more children in private school suffered from overweight and obesity. Gender wise there was no much difference in overweight and obesity proportion. With advancement in age, obesity and overweight increased as it was more in age group of 13-15 years as compared to 10-12 years.

Key Words: Overweight, obesity, BMI, prevalence, School children.

Introduction:

Overweight and obesity are among the most prevalent nutritional problems in developed and developing countries. The problem of obesity is confined not only to adults but also to children and adolescents. The World Health Organization (WHO) defined, adolescence as the period from 10 to 19 years of age [1]. In India, approximately 19 percent of the growing population comprises school aged children. Nutritional status of the Indian population varies significantly across the region. Certain regions are associated with extremely high rates of childhood under nutrition ranging from 20 percent to 80 percent while others have a high prevalence of childhood over nutrition [2]. In Indian children, overweight and obesity are common among middle and low income groups, however, in the developed nations, a higher prevalence of childhood obesity can be seen in low SES. Children are the wealth of any nation as they constitute one of the important segments of the population. School age is considered as dynamic period of growth and development as children undergo physical, mental, emotional and social changes.

The fundamental causes behind the rising levels of obesity are increased intake of energy dense foods that are high in fat, salt and sugars and a decreased physical activity due to changing modes of transportation, and increasing urbanization. Studies from metropolitan cities in India, have reported a high prevalence of obesity among affluent school children and Delhi have shown the prevalence of

obesity as 20% and 29% respectively [3]. Obesity is also a risk factor associated with hypertension, respiratory disease, orthopedic disorders, diabetes mellitus and elevated serum lipid concentrations. Adolescent obesity is thought to be associated with some psychological problems like low self esteem, feeling of inadequacy, anxiety, social dysfunction, depression and moodiness; all of these affect the personality of adolescents.

In developing countries such as India, especially in urban populations, childhood obesity is emerging as a major health problem. Limited data is available on the prevalence of obesity in children in Indian sub-continent. Maharashtra is an economically advanced state of country, and Aurangabad, capital of Marathwada region from Maharashtra has a large population of affluent families who are exposed to modern life style. Children belonging to middle school and high school are particularly vulnerable to external factors owing to newfound independence, influence through peer pressure and exposure to media. Very few studies on prevalence of overweight and obesity among school going children from this area has been conducted. Therefore, our study was carried out to identify such target groups.

Aim & Objective:

To assess the prevalence of overweight and obesity among school going children of age 10 to 15 years from Aurangabad city, India.

Materials and Methods:

A) Study Area:

The study was carried out in Aurangabad city, administrative headquarter of Marathwada region of Maharashtra state, India. Students from different schools of Aurangabad city were selected.

B) Study Design:

A comparative, cross-sectional study design was selected for present study.

C) Duration of Study :

Present study was conducted during the period of 1st July 2013 to 31st Jan. 2014.

D) Selection of Schools :

List of all middle and high schools from Aurangabad city was obtained from education office. The schools were selected from different zones in the

city to get an equal distribution of children by socio-economic status, ethnic variability and gender. Total 24 schools, 12 government and 12 private schools were selected for present study.

E) Sample Size :

With help of practical manual for sample size determination by Lwanga and Lemeshow (1966), Sample size was determined, considering prevalence rate of overweight and obesity as 7% .[4] The resultant sample size was 5314 children, but we included 6000 children.

F) Selection of Subjects:

Selection of children between age group 10 to 15 years was done by probability proportionate to size of the population (PPS) technique.

Inclusion Criteria :

Children in the age group of 10 to 15 years studying in schools from Aurangabad city.

Exclusion Criteria :

Children below age 10 years and above age 15 years.

Children from schools outside Aurangabad city and those who remain absent on survey day.

Children with chronic illness, endocrinal problems, physical and mental defects.

Research Tools :

A pre-designed and pre-tested schedule was used to collect data on different aspects related to children's overweight and obesity.

Major anthropometric measurements taken for the investigation were age, height and body mass index by using standardized protocols adopted. Overweight and obesity were defined as per CDC growth charts.[5]

Data Analysis :

Data was analyzed by using SPSS version 20.

Difference may be due to different age range of children selected for study.

Results:

A total of 6000 children in the age group of 10-15 years were screened for study.

Table: 1 depicts the summary of the assessed children's BMI for age and sex, and their classification into those who are overweight and obese as per CDC growth chart.

Table: 1 Distribution of children according to BMI

BMI	Category	No. of students	Percentage
≤5 th percentile	Underweight	1491	24.85
5 th to 85 th percentile	Normal weight	3909	65.15
85 th to 95 th percentile	Overweight	420	7.00
≥95 th percentile	Obese	180	3.00
Total		6000	100

On the whole, there were 7% (420) of the children were overweight and 3% (180) children were obese. Out of 6000 children 3909 (65.15%) children had normal BMI and 1491 (24.85%) children were underweight.

Table:2: Distribution of Children according to age:

Age groups	Under weight	Normal weight	Over weight	Obese	Total
10-12 yrs.	770 (26.16)	1927 (65.47)	152 (5.46)	94 (3.19)	2943 (49.05)
13-15 Yrs.	721 (23.58)	1982 (64.83)	268 (8.76)	80 (2.81)	3057 (60.95)
Total	1491 (24.89)	3909 (65.15)	420 (7.0)	180 (3)	6000 (100)

(Figures in parenthesis indicate percentage)

Total 6000 children were classified into two age groups, 10-12 year (2943) and 13-15 year (3057). Prevalence of overweight was 5.16% and 8.76% for 10-12 years and 13-15 years respectively. There were total 94 (3.19%) children obese in the age of 10-12 years and 86(2.81%) children obese in the age of 13-15 years.

Table: 3: Distribution of children according to Gender:

Gender	Under weight	Normal weight	Over weight	Obese	Total
Male	756 (23.47)	2141 (66.49)	216 (6.79)	107 (3.32)	3220 (53.60)
Female	735 (26.43)	1768 (63.59)	204 (7.33)	73 (2.62)	2780 (46.83)
Total	1491 (24.89)	3909 (65.15)	420 (7.0)	180(3.0)	6000 (100)

(Figures in parenthesis indicate percentage)

BMI in boys and girls were calculated separately to study the prevalence of overweight and obesity gender wise.

Out of total population, 6.79% boys were overweight and 3.32% were obese where as 7.33% girls were in the category of overweight and 2.62% were in obesity group. The combined overweight and obesity in boys and girls was 10.02% and 9.95% respectively.

Table 4: Distribution of children according to school type :

Type of School	Under weight	Normal weight	Over weight	Obese	Total
Government	967 (36.96)	1436 (54.89)	163 (6.23)	50 (1.91)	2616(43.6)
Private	524 (15.84)	2473 (73.07)	257 (7.59)	130 (3.84)	3384 (56.4)
Total	1491 (24.89)	3909 (65.15)	420 (7.0)	180 (3.0)	6000 (100)

(Figures in parenthesis indicate percentage)

From government schools, 6.23% and 1.91% children belongs to overweight and obese group respectively, whereas 7.59% and 3.84% of children were from overweight and obese group respectively from private schools.

Prevalence of overweight and obese was low in government schools as compared to private schools. The combined prevalence of overweight and obesity in private schools was higher (11.43%) as compared to government schools (8.14%).

Discussion:

The present study reported prevalence of overweight as 7% and obesity as 3% from Aurangabad school children. Dhole & Mundada (2013) also reported 7.5% prevalence for overweight and 6.3% for obesity from same region [6]. Similar results were seen by Janhavi et al (2011), 6.5% for overweight and 3% for obesity, Rawat et al (2012) noted 9.8% for overweight & 3.7% for obesity [7, 8]. Aggrawal et al and Khadilkar et al however reported a prevalence of obesity as 3.4% and 5.7% respectively which was lower as compared

to our study.[9,10]. The difference may be due to different age range of children selected for study.

Prevalence of overweight was more at age of 13-15 years than 10-12 years, but prevalence of obesity was more in the age 10-12 years as compared to 13-15 years age. Combined prevalence of overweight and obesity was more in the age group of 13-15 years (11.57%) as compared to 10-12 years (8.35%). S Kumar et al also observed that prevalence was higher among children of higher age group as compared to younger ones[11]. Keerthan Kumar et al (2011) also noticed a positive co-relation between age and obesity. The prevalence of overweight (5.2%) and obesity (3.89%) was highest in 15 years age group in their study. They also recorded as age advances there is a significant increase in the prevalence of obesity [12]. The reason behind this may be hormonal changes associated with age and maturity in children.

Although the combined prevalence of overweight and obesity in both gender is more or less same, but the prevalence of obesity individually is high in boys as compared to girls. Girls are slightly overweight than boys. It may be due to the reason that girls are often kept deprived of outdoor activities and sports as compared to boys from safety point of view. In addition to this most of the students are now engaged in indoor games, internet use and adopted sedentary life-styles making them obese.

A study conducted by Rebecca (2014) on Aurangabad school children also mentioned combined prevalence of overweight and obesity in boys and girls as 15.7% and 14.2% respectively. [13]. Similar findings were observed by Jigna Shah (2013) and Jhanvi et al (2011) [14, 7].

When prevalence of overweight and obesity is compared with type of school private school noted higher prevalence rates. Dhole and Mundada (2013) also noted prevalence of overweight and obesity was higher in private schools than government schools. [6]. Ramchandran et al(2002), Mohanty et al (2007), Rebeca (2014), also observed similar results. [15, 16, 13]. High prevalence of obesity in private schools children may be due to the better economic condition of parents, providing enough food and money to their children. On the contrary, government school children belongs to middle and low income group and prefer homemade food.

Conclusion:

The overall prevalence of overweight and obesity in present study was 7% and 3%

respectively. Percentage of overweight and obese children studying in private schools were more as compared to government school children. Gender wise there was no much difference in overweight and obesity proportion. Combined prevalence of overweight and obesity increased with advancement in age.

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