A Cross sectional study on the Prevalence of Overweight and obesity and its association with Dietary pattern among school going children

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Abstract

Aim: The aim of the study was to determine the prevalence of overweight and obesity and to identify its association with the dietary factors among 10-15 years school children.

Material and Method : Parameters of height and weight were measured and recorded following the completion of the questionnaire and the results were compared against the body mass index for age percentiles of both sexes (body mass index percentile charts) developed by National Center for Health Statistics in collaboration with National Center for Chronic Disease Prevention and Health Promotion (World Health Organization)

Results: The prevalence of overweight and obesity was13.22% and 6.82% among school children aged between10-15 years. The present study found positive association of overweight and obesity with calories consumed per day and snacking habit.

Conclusion: Prevalence of overweight and obesity were high among the school children and need to be addressed by primary and secondary methods of prevention.

Key words: Dietary factors, overweight; obesity.

Introduction

Childhood obesity is a public health problem of increasing concern in the developed world and in populations undergoing cultural transition[1]. The World Health Organization, in 1998 designated obesity as a global epidemic[2]. India is also facing the epidemic of obesity and its associated diseases, especially in children and adolescents [3]. Childhood obesity is associated with an increased mortality and morbidity in form of coronary artery disease, diabetes mellitus hypertension, and dyslipidaemia[4-9].

As shown in many countries, there is a change in the dietary pattern from a more traditional dietary pattern to western dietary pattern that has been associated with an increase in the overall prevalence of overweight/obesity [10]. Obesity is usually as a result of excessive intake of calories more than those required by a person's energy need (Energy Intake – Energy Consumption)[11]. Researches on dietary patterns showed that obese adolescents possess undesirable dietary patterns in terms of food preferences and consumption frequencies such as Sugar-sweetened carbonated beverages, fast foods and instant foods are favorite food items in their diet which are categorized as high energy density and poor quality foods. Irregular meal patterns including skipping breakfast are regarded as one of influential factors explaining nutritional imbalance of adolescents. Carbonated drink consumption has doubled between 1998 and 2005, along with the increased consumption of instant noodles and fast foods thereby contributed more energy intake from fat and sugar eventually plays a major role in high prevalence obesity among adolescent [12]. These changes in eating patterns might explain the marked increase in children's obesity because foods are generally not eaten in isolation, and the overall pattern of consumption may have a greater cumulative

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impact on obesity than any single food or nutrient[13]. Fueled by urbanization and the advent of the global economy, these changes in eating patterns are the most rapid and dramatic in the course of human history. The term "Coca-colonization,"a reference to the ubiquitous presence of Coca-Cola, Pepsi, and McDonald's, describes a world that is moving toward a common diet[14,15].

Objective

1. To assess the Prevalence of Overweight and Obesity among school children aged 10 to 15 years.

2. To determine the role of dietary patterns in association with overweight and obesity.

Material and Methods

Study Design

The present study is a Cross sectional study undertaken to know the prevalence of Overweight and Obesity and its association with dietary pattern among 10-15 years school going children in Gulbarga city.

Sample Size

1,642 School children aged between 10 to 15 years in Gulbarga city were screened. The sample size was calculated keeping in the prevalence of Obesity as 5.74% [16] as reported by an earlier study in Davangere.

Method of Data Collection

In Gulbarga city there are 212 schools having total children 29,715 aged between 10-15 years. Cluster sampling method is used, after selecting the cluster (schools) randomly by lottery method. All children between 10-15 years in that cluster (school) are included in the study, if the school population in that selected cluster is less than the required sample; we select the second cluster by lottery method and repeat the process till the required sample is obtained. Hence we got 5 schools in our study to meet the required sample. The list of Government and Private schools along with the number of students studying between 10-15 years were taken from the office of Deputy Director of school Education, Gulbarga. After selecting the school, prior consent from school authorities was obtained. The students between 10- 15 years were interviewed personally with the help of oral questionnaire. A predesigned, pretested questionnaire Performa was administered to each child to collect data on age, sex, religion, education , dietary pattern, intake of different food items etc. Parameters of height and weight were measured and recorded. The age of the children was obtained from the school records. The height was measured by making the child to stand upright, barefoot on the ground with heels, buttocks and shoulder touching the wall and head in Frankfurt plane. The height was measured using sliding stadiometer (Johnson and Johnson) with an accuracy of 0.1mm.Weight was recorded using spring balance (bathroom scale) calibrated to 0.5 kg accuracy. International Obesity Task Force (IOTF) classification was utilized for the estimation of overweight and obese subjects. Underweight was defined as children with BMI less than 5th percentile and healthy weight with 5th percentile to less than the 85th percentile, Overweight (OW) with BMI value between 85th to 95th percentile and obesity (OB) with a BMI value above 95th percentile for their specific age and sex [17]. In the entire programme the help of the teachers of the respective classes were taken Repeated visits were done to the same school to examine those students who were absent at the previous visit.

Results

Table 1 shows that majority 371(22.59%) were in the age group of 13 years followed by 327(19.91%) in the age group of 12 years and least belong to age group of 10 years97(5.91%). The above table also shows that out of 1642 students, 953(58.04%) were males and 689 (41.96%) were females.

Table 2 shows that among the 1642 studied students, the prevalence of overweight and obesity were 217(13.22%) and 112(6.82%) respectively. A study done by M Shashidhar et al[18] among 12-15 years adolescent in Mangalore in the year 2010 revealed that the prevalence of overweight and obesity was 9.9% and 4.8% respectively. Similarly a study conducted by T Aggarwal et al[19] among affluent adolescent school children in Ludhiana in the year 2008 revealed that the prevalence of overweight was 12.7% and obesity was 3.4% respectively.

Table 3 shows that the prevalence of both overweight and obesity were more among those students who consumed more than 2000 kcal per day(21.56% and

31.74%) followed by consumption of 1500-2000 kcal per day(24.83% and 10.93%). Hence amount of calories consumed per day was highly significantly associated with overweight and obesity (p<0.001) .A study done by Ibrahim et al [20] among adolescent aged 10-14 years in Kuwait in the year 2006 revealed that the prevalence of overweight and obesity were more in those children who consumed high daily caloric intake. A study done by Jin-Sook et al[21] among high school children in Korea in the year 2010 revealed a significant positive co-relation between energy intake from snacks and total daily energy intake.

Table 4 shows that the prevalence of overweight and obesity were high in those students who were consuming junk foods as compared to those groups who were not consuming, which were found to be statistically highly significant (P<0.001). In a study done by S Kumar et al[16] among affluent school children aged 10-15 years in Davangere city in the year 2007 revealed that snacking of high energy dense food was an important factor associated with obesity. A tudy done by Nicklas TA et al [22] among children aged 10 years in Texas in the year 2003 reveals that consumption of sweetened beverages, sweets, meat, total consumption of low quality food and also total amount of food consumed specially from snacks were positively associated with overweight status (p<0.05).A study done by Ming Li et al [23] among adolescent aged 11-17 years in China in the year 2010 reveled that an increased consumption of soft drinks was associated with increased risk of overweight and obesity (1100 mL/day, OR: 1.9, 95% CI: 1.1-3.8) an increased consumption of energy-dense foods like potato chips etc (OR: 1.7, 95% CI: 1.04-2.9), was associated with increased risk of overweight and obesity.

Table 1. Distribution of subjects according to age and sex

Age	Sex					
	Male		Female		Total	
	Number	Percentage	Number	Percentage	Number	Percentage
10	55	3.35	42	2.56	97	5.91
11	168	10.23	132	8.04	300	18.27
12	202	12.30	125	7.61	327	19.91
13	197	12.00	174	10.60	371	22.59
14	173	10.54	100	6.09	273	16.63
15	158	9.62	116	7.06	274	16.69
Total	953	58.04	689	41.96	1642	100.00

Table 2. Classification of BMI in school children

Classification	No of students	Percentage
Underweight	388	23.63
Normal weight	925	56.33
Overweight	217	13.22
Obesity	112	6.82
Total	1642	100.0

Table 3. Association between calories consumed and BMI

Calories consumed	Under weight		Normal weight		Over weight		Obesity		Total	
	No	%	No	%	No	%	No	%	No	%
<1000	72	28.69	166	66.14	10	3.98	3	1.2	251	100.0
1000-1500	209	26.62	506	64.46	62	7.9	8	1.02	785	100.0
1500-2000	93	21.18	189	43.05	109	24.83	48	10.93	439	100.0
>2000	14	8.38	64	38.32	36	21.56	53	31.74	167	100.0
Total	388		925		217		112		1642	100.0

X^2=359.91   d.f=9   P<0.001   Highly Significant

Table 4. Association between snacks consumption and BMI

Junk Foods	Underweight (388)				Normal Weight (925)				Overweight (217)				Obesity (112)				Tests	
	Yes		No		Yes		No		Yes		No		Yes		No			
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	c^2-test	P-value
Chocolate	60	4.88	328	79.61	857	69.67	68	16.50	206	16.75	11	2.67	107	8.70	5	1.21	955.98	P<0.001
Chips	132	11.96	256	47.58	694	62.86	231	42.94	182	16.49	35	6.51	96	8.70	16	2.97	264.62	P<0.001
Puffs/ Samosa	125	10.98	263	52.18	722	63.44	203	40.28	187	16.43	30	5.95	104	9.14	8	1.59	342.41	P<0.001
Pizza	84	14.84	304	28.25	308	54.42	617	57.34	115	20.32	102	9.48	59	10.42	53	4.93	78.21	P<0.001
Soft Drinks	167	18.29	221	30.32	513	56.19	412	56.52	148	16.21	69	9.47	85	9.31	27	3.70	57.44	P<0.001
Fast Food	153	17.67	235	30.28	494	57.04	431	55.54	141	16.28	76	9.79	78	9.01	34	4.38	53.60	P<0.001
Pani Puri	147	13.28	241	45.05	734	66.31	191	35.70	126	11.38	91	17.01	100	9.03	12	2.24	247.04	P<0.001

Conclusion

The percentage of overweight and obese children is growing in Gulbarga also like in other states and other parts of the world. The present study found positive association of Overweight and Obesity with amount of calories consumed per day and snacking habits thus primary prevention is possible by modifying obesogenic environmental factors such as increased physical activity, dietary modification, behavioral changes etc. Long term studies have shown beneficial effects of life style modifications on reducing the risk of obesity. If immediate measures are not taken then India is going to face big challenge posed by the rising prevalence of obesity incidence through and its future complication unless steps are taken to implement the primary prevention of obesity.

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