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A Study of Prevalence of Overweight and Obesity Among High School Students in a Private School in Gulbarga

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Abstract

Over the last decades pediatric obesity has become global epidemic with an estimate of 45 million children and adolescent being affected and this is exponentially increasing. Obesity is leading to a significant mortality and morbidity.

Aims and Objective:

1 .To determines the prevalence of overweight and obesity among high school students.

2. .To assesses the risk factors associated with Overweight and Obesity in them.

3. To suggest interventional strategies for prevention and control of overweight and obesity.

Design: A cross sectional study was conducted among 13- 15years high school students. Parameters of height, weight were measured and recorded following the completion of a questionnaire and the results were compared against the body mass index for age percentiles of both sexes.

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

Keywords: Childhood obesity, obesity

Introduction

The term “Obesity” - derived from the Latin word obesus, meaning 'having eaten until fat' - describes an excessive accumulation of body fat (adipose tissue), usually caused by the consumption of more calories than the body requires to fuel its energy requirements.[1]

Childhood obesity was considered a problem of affluent countries. Today this problem is appearing even in developing countries. Globally, IASO/IOTF estimate that up to 200 million school aged children are either overweight or obese, of those 40-50 million are classified as obese.[4]

Based on data from the 2007 National Family Health Survey, percentage of people in India who are Overweight or Obese are 12.1% males and 16% females.[2]

Adolescence seems to be one of the critical periods in the development of obesity. Epidemiological literature shows that about one-third of obese pre-school

children and about one-half of obese school age children become obese adults.[3]

The environmental features of modern lifestyles that contribute to the increasing prevalence of obesity include wide availability of food that is energy dense, palatable and inexpensive, combined with increasing sedentary pursuits like TV watching, video games, internet and mobile usage, Obesogenic schools and Tution classes which focus on academic pursuit at the cost of physical activity sessions.[5]

Owing to the complex interplay of etiological factors like genetic, environment and human behavior and lack of clear comprehension of this is making the prevention and management of childhood obesity challenging.

The most effacious and reliable way to prevent and treat this disease and its co morbidities is a healthy , balance lifestyle with realistic diet plan and exercise regimen.

Exact data on prevalence of childhood obesity in different parts of our country (India) are unavailable in spite of some sporadic studies on obesity indicating that the problem is quite alarming in the developing countries. It is the times to act now if the deleterious effects of obesity are to be avoided.

Hence a modest attempt is being made in Gulbarga city to find out the prevalence of Overweight and Obesity in School children aged between 13-15 years.

Material and Methods

The present study is a Cross sectional study undertaken to know the prevalence and also to find out the various risk factors associated with Overweight and Obesity among 13-15 years studying in Chandrakant Patil English Memorial School, Gulbarga.

The present study was carried out in 150 students studying in 8^{th} to 10^{th} class.

A predesigned, pretested questionnaire proforma was administered to each child to collect data on socio-demographic profile (age, sex, religion, dietary pattern, physical activity level, T.V watching etc.) Parameters of height and weight were measured and recorded following completion of the questionnaire.

The height was measured using sliding stadiometer with an accuracy of 0.1mm.Weight was recorded using spring balance (bathroom scale) calibrated to 0.5 kg accuracy. Body Mass Index (BMI) was calculated based on the formula-

$$BMI = \frac{\text{Weight (Kg)}}{\text{Height (m}^2\text{)}}$$

The results were compared against the body mass index for age percentiles of both sexes (body mass index percentile charts) developed by National Institute of nutrition.

Data Analysis: The statistical tests used are percentages and chi-square test. The statistical software SPSS 12 was used for the analysis of the data and Microsoft word and Microsoft Excel have been used to generate graph, tables etc

Weight Status Category	Percentile Range
Underweight	Less than the 5th percentile
Healthy weight	5th percentile to less than the 85th percentile
Overweight	85th to less than the 95th percentile
Obese	Equal to or greater than the 95th percentile

Results:

Out of 150 students, 88 (58.67%) were boys and 62 (41.33%) girls. 34 (22.67%) students were 13 years old. 62 (41.33%) were 14 years old and 54 (36%) were 15 years old.

TABLE 1: Classification Based on BMI

Classification	No of students	Percentage
1.Underweight	13	8.66
2. Normal weight	117	78
3.Overweight	15	10
4.Obesity	5	3.34
Total	150	100.0

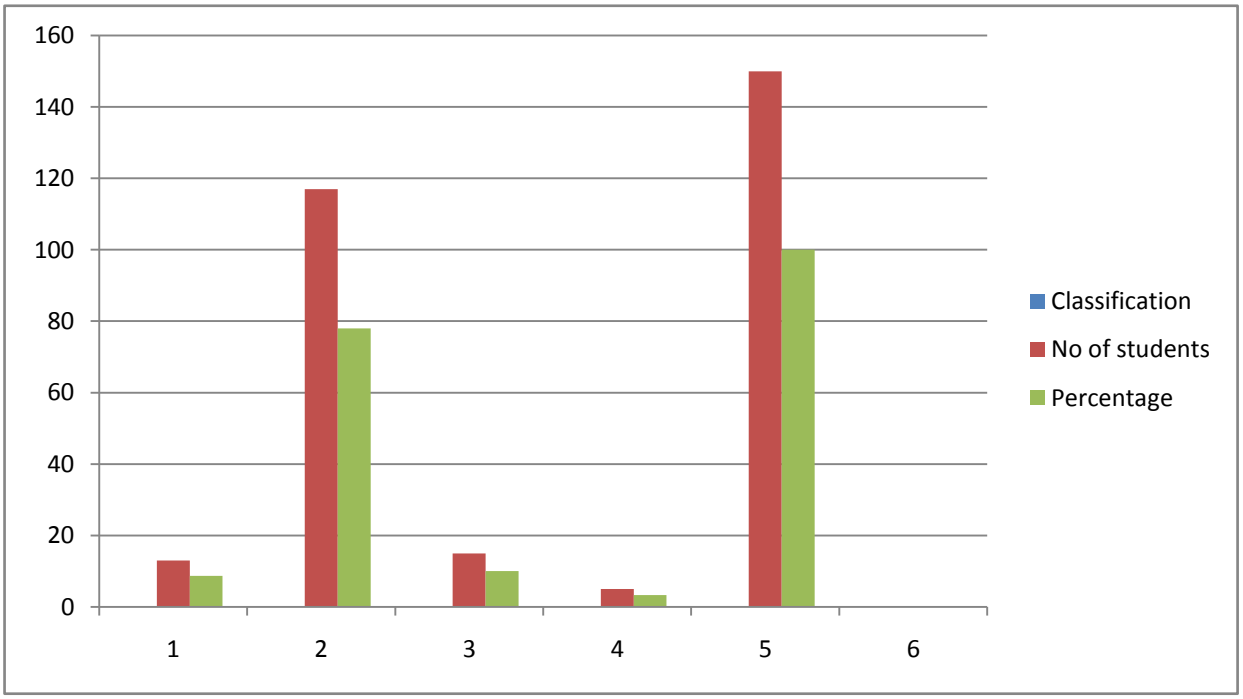

Figure: 1

The above table & graph shows that among the 150 studied students, the prevalence of overweight and obesity were 15(10%) and 5(3.34%) respectively. The prevalence of underweight was 13 (8.6%).

Table: 2 Association between age and BMI

	Underweight		Normal		Overweight		Obese		Total	
Age(yrs)	no	%	no	%	no	%	no	%	No	%
13	5	14.71	24	70.59	4	11.76	1	2.94	34	100
14	5	8.06	50	80.65	5	8.06	2	3.23	62	100
15	3	5.56	43	79.63	6	11.11	2	3.70	54	100
Total	13		117		15		5			100

X^{2} = , df = , p=

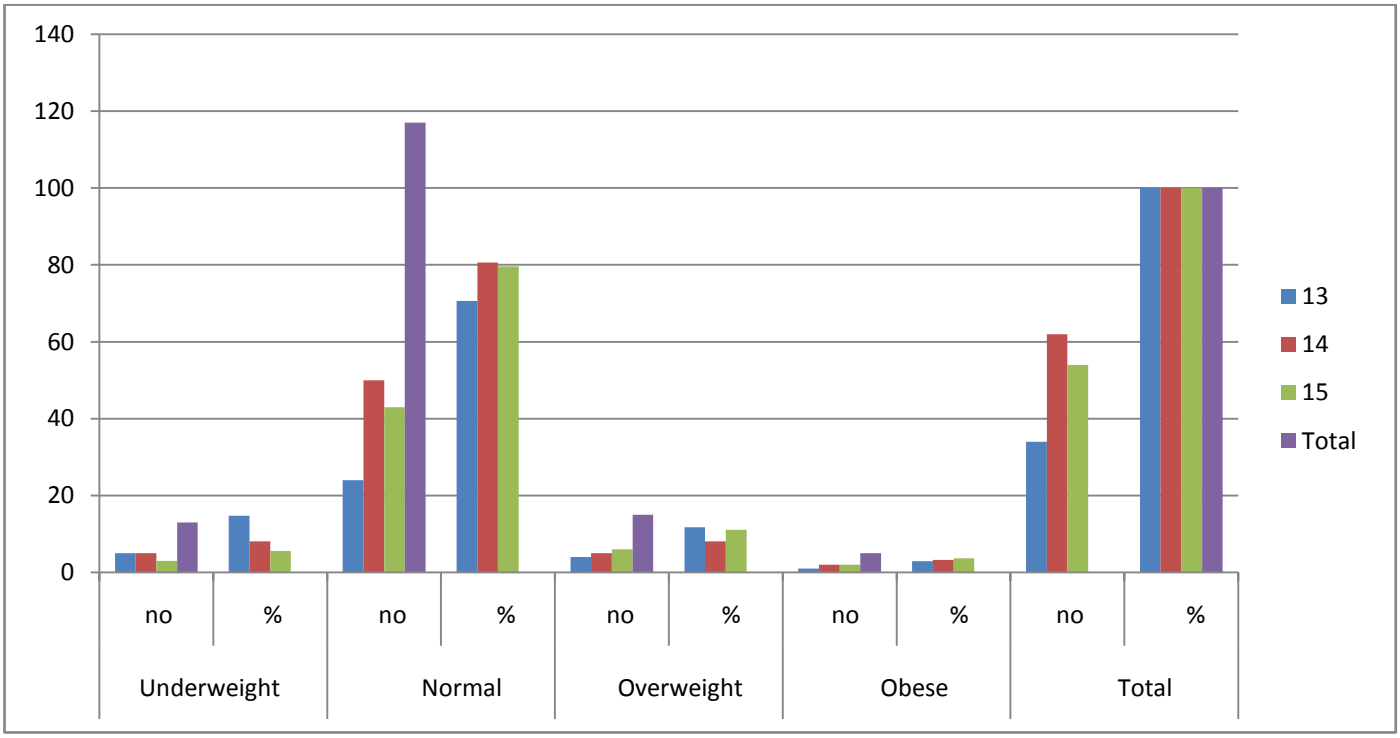

Figure: 2

The above table and graph shows that prevalence of overweight and obesity were more among 15 years students with 11.11% and 3.79% respectively, followed by 14years students with 8.06% and 3.23% respectively and 13 years students with 11.76% and 2.94% respectively. Age was significantly associated with overweight and obesity (P<0.01)

Table 3 : Association between sex and BMI

	Underweight		Normal		Overweight		Obese		Total	
Sex	no	%	no	%	no	%	no	%	No	%
Male	10	11.36	73	82.95	4	4.55	1	1.14	88	100
Female	3	4.84	44	70.97	11	17.74	4	6.45	62	100
Total	13		117		15		5		150	100

X^2= df= p =

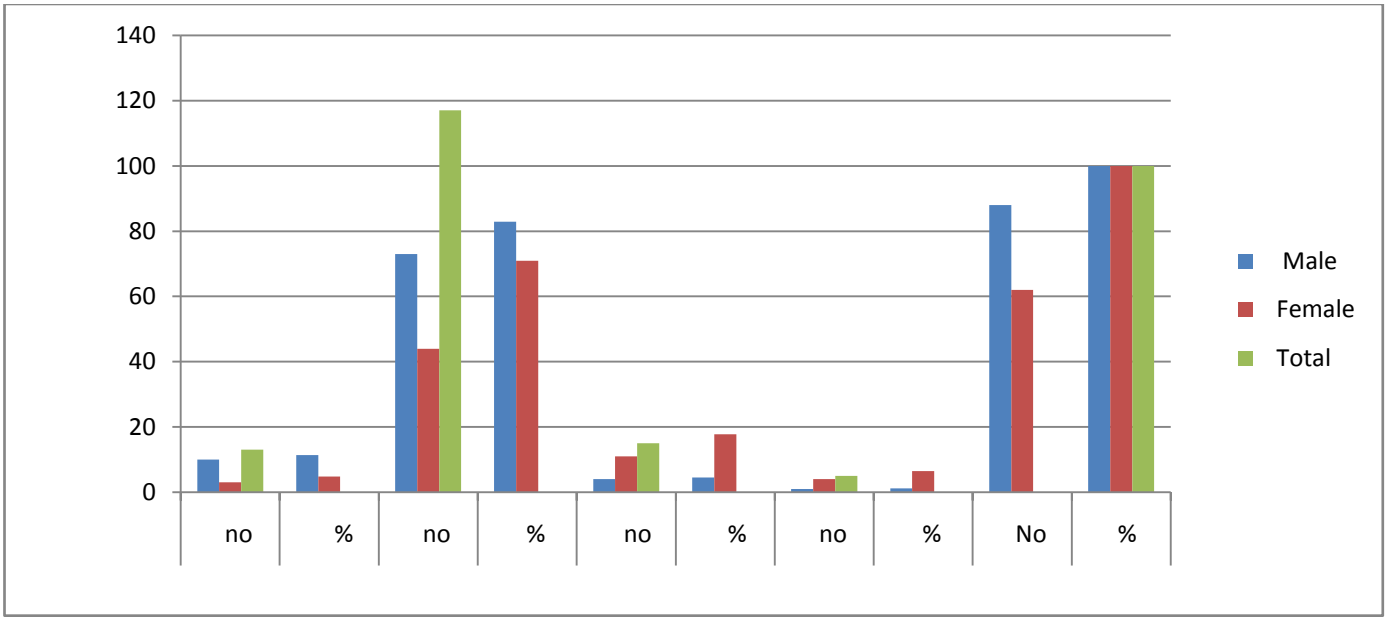

Figure:3

The above table and graph shows that prevalence of overweight and obesity among males were 4.55% and 1.44% respectively and more among females with 17.74% and 6.45% respectively. Sex was significantly associated with overweight and obesity ($p<0.01$).

Table 4: Association between participation in Physical activity and BMI

	Underweight		Normal		Overweight		Obese		Total	
Physical activity	no	%	no	%	No	%	no	%	no	%
< 30 min/day	4	5.47	50	68.49	14	19.17	5	6.84	73	100
>30 min/day	9	11.69	67	87.01	1	1.30	0	0	77	100
Total	13		117		15		5		150	100

X^2 = df= p =

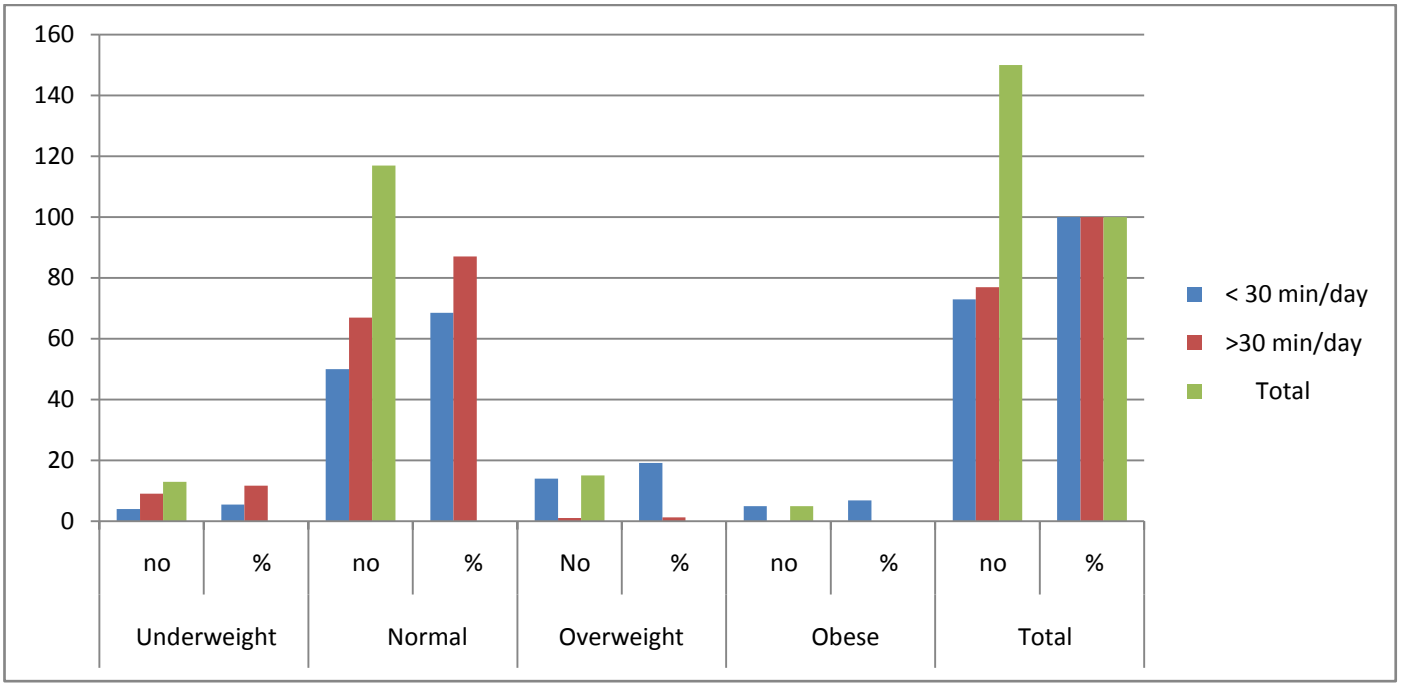

Figure: 4

The above table and graph shows that the prevalence of both overweight and obesity were more among those students who did not participated in any of the physical activities (19.17% and 6.84%).Which were found to be statistically highly significant($p<0.001$)

Table 5: Association between sedentary sitting hours and BMI

	Underweight		Normal		Overweight		Obese		Total	
Sedentary hours	no	%	no	%	no	%	no	%	no	%
< 5hrs/ day	9	11.25	67	83.75	4	5	0	0	80	100
>5hrs/day	4	5.71	50	71.42	11	15.71	5	7.14	70	100
Total	13		117		15		5		150	100

X^2 = df= p=

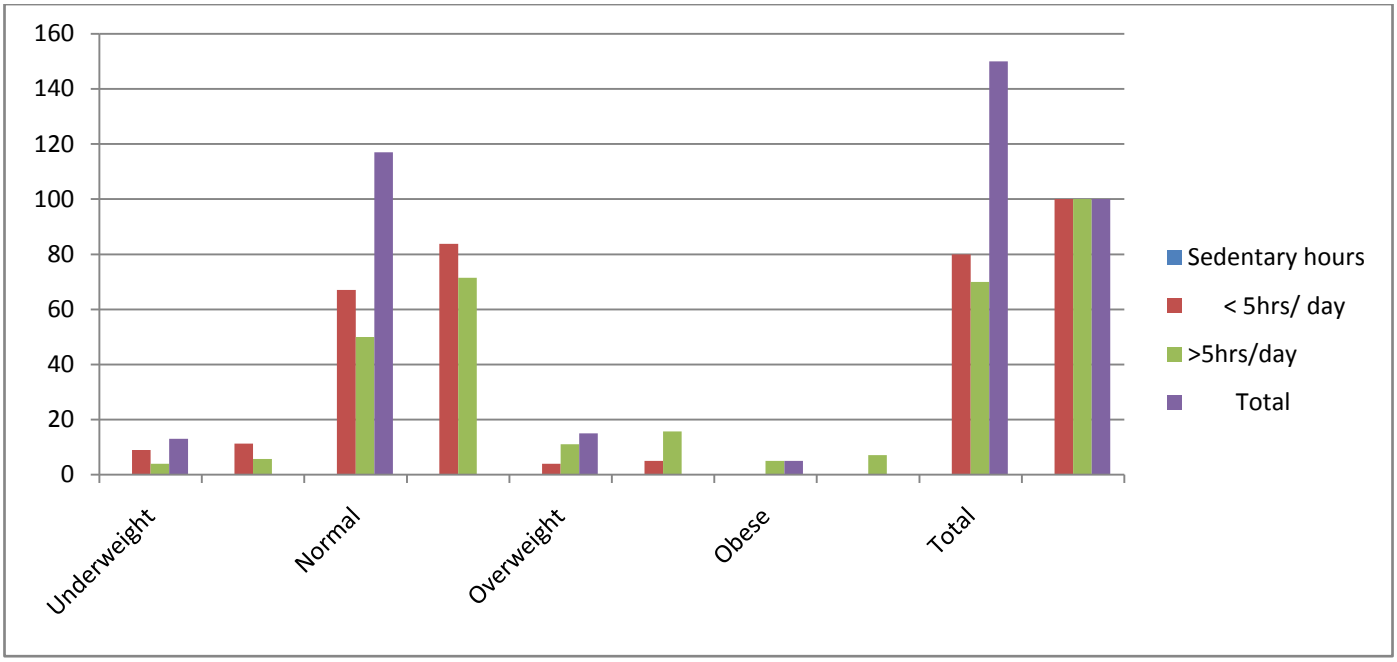

Figure: 5

The above table and graph shows that the prevalence of both overweight and obesity were more among those students who had longer sedentary hours of sitting and studying(15.71% and 7.14%) Which were found to be statistically highly significant ($p<0.001$).

Table 6: Association between TV watching & mobile,media usage time and BMI

	Underweight		Normal		Overweight		Obese		Total	
TV, Media time	no	%	no	%	no	%	no	%	No	%
< 2hrs/day	6	7.79	68	88.31	3	3.89	0	0	77	100
>2hrs/day	7	9.58	49	67.12	12	16.43	5	6.84	73	100
Total	13		117		15		5		150	

X^2= d.f= p=

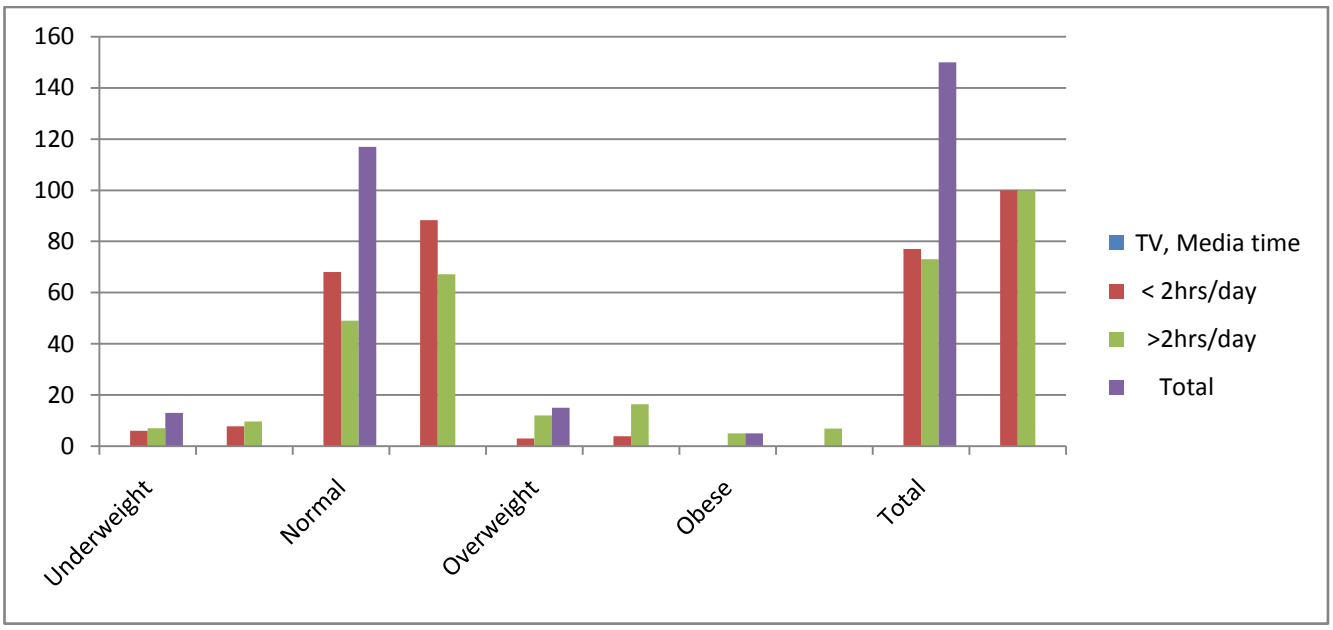

Figure:6

The above table and graph shows that the prevalence of overweight and Obesity was more in those students who watched Television , used mobiles internet and other media for more than 2hours in a day (16.43% and 6.84%). Hence this was significantly associated with overweight and obesity ($p<0.05$).

Table 7 : Association between outdoor sports and BMI

	Underweight		Normal		Overweight		Obese		Total	
Outdoor activity	no	%	no	%	no	%	no	%	no	%
< 30min/day	5	7.78	44	66.67	13	19.7	4	6.06	66	100
>30min/day	8	9.52	73	86.90	2	2.38	1	1.19	84	100
Total	13		117		15		5		150	

X^2= df= p=

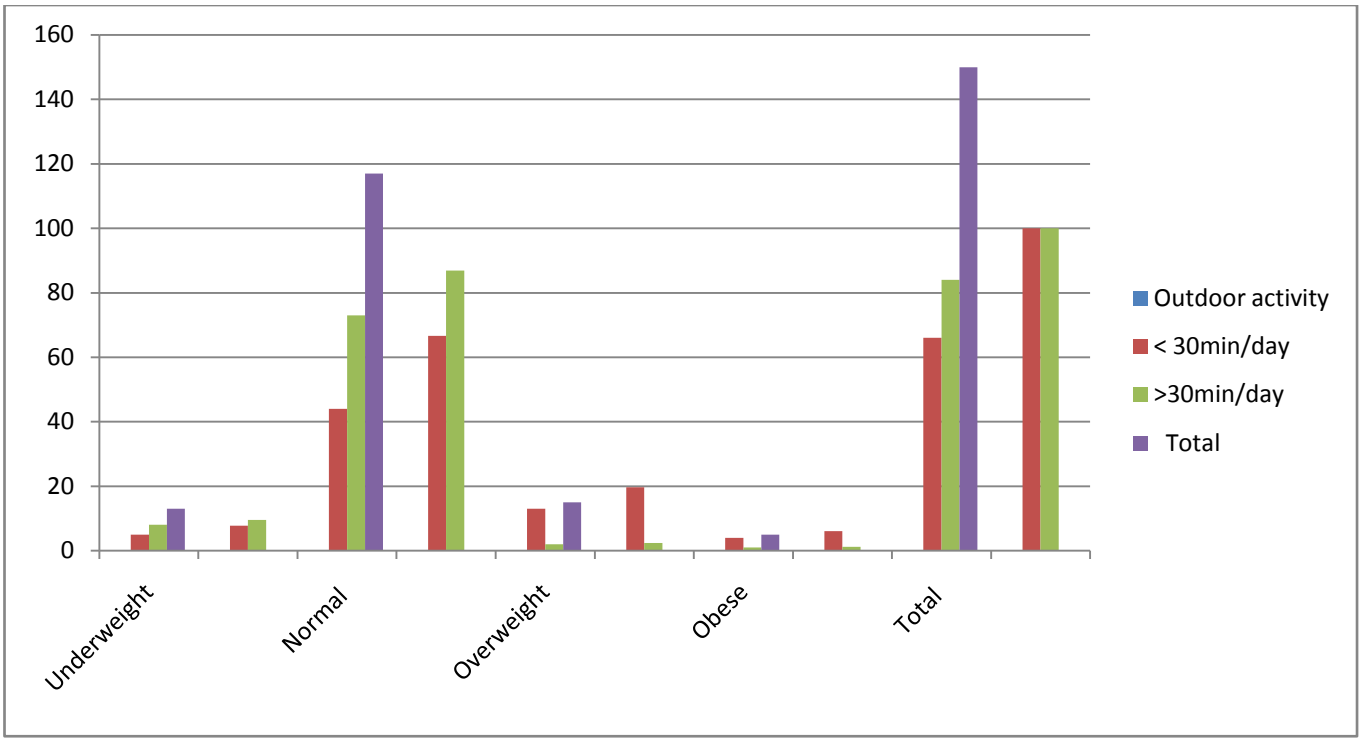

Figure: 7

The above table and graph shows that the prevalence of both overweight and obesity were more in those students who did not participated in any of the outdoor sports (19.7% and 6.06%).Which were found to be statistically highly significant($p<0.001$).

Table 8 : Association between frequent junk snacking and BMI

	Underweight		Normal		Overweight		Obese		Total	
Junk snacking Frequently (>2times/ week)	no	%	no	%	no	%	no	%	No	%
No	5	6.33	69	87.34	5	6.33	0	0	79	100
Yes	8	11.27	48	67.61	10	14.08	5	7.04	71	100
Total	13		117		15		5		150	

X^2= d.f= p=

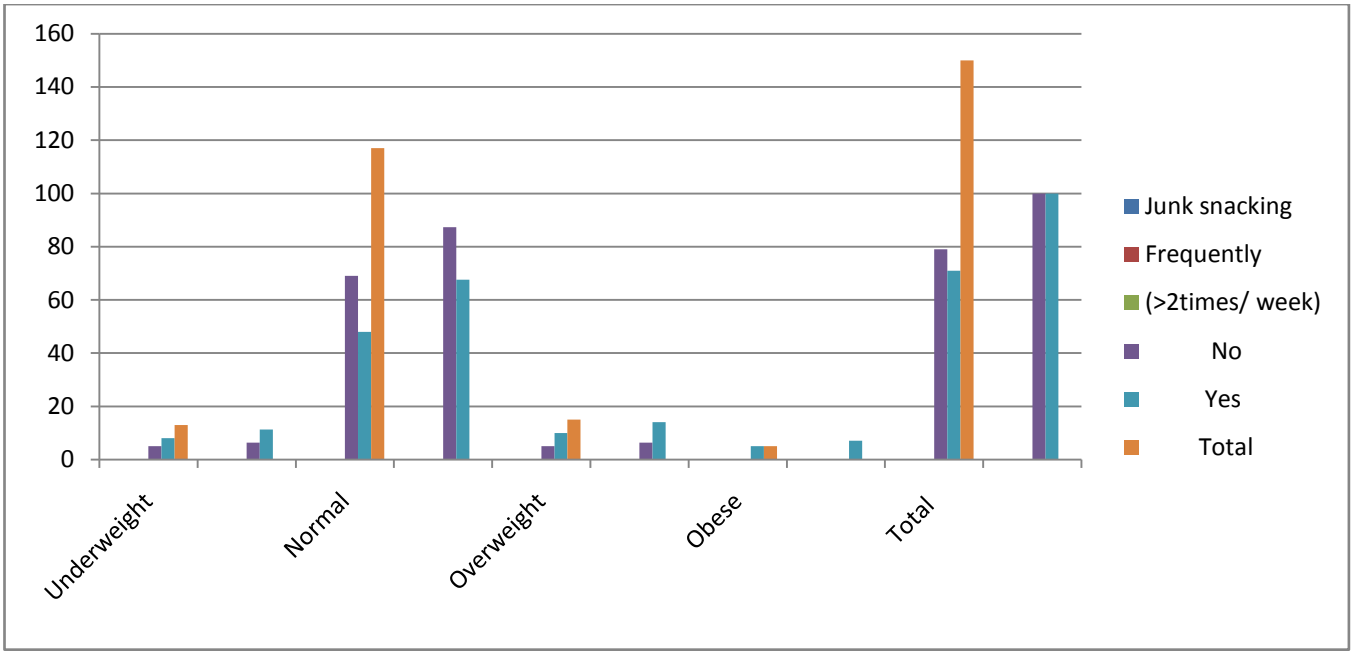

Figure: 8

The above table and graph shows that the prevalence of overweight and obesity were high in those students who were consuming junk foods (14.08% and 7.04%) as compared to those groups who were not consuming. Which were found to be statistically highly significant (P<0.001)

Discussion

The present epidemiological cross-sectional study was carried out in a Private school of Gulbarga city. This study consisted of 150 students between ages 13-15 years who were undertaken to know the prevalence of overweight and obesity and also to study its certain associated risk factors.

Prevalence of overweight and obesity

The present study showed that the prevalence of overweight and obesity among 13-15 years students was 13.34%.Out of which 10% (15) were overweight and 3.34% (5) were obese (Table-1).

A study conducted by T Aggarwal et al[6] among adolescent school children in Ludhiana in the year 2008 revealed that the prevalence of Overweight was 12.7% and obesity was 3.4% respectively.

Similarly a study done by M Shashidhar et al[7] 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.

Association between overweight and obesity and Sex

The present study shows that prevalence of overweight and obesity among males were 4.55% and 1.44% respectively and more among females with 17.74% and 6.45% respectively. Hence sex was significantly associated with overweight and obesity (p<0.01) (Table-3).

In a study done by S Kumar et al[8] among affluent school children aged 10-15 years in Davangere city in the year 2007 revealed that the prevalence of obesity was more in girls (8.82%) than boys (4.42%).

Similarily in a study done by Mikki N et al[9] among 13-15 years adolescent in Palestine in the year 2009 revealed that the prevalence of overweight and obesity among girls (15.6% and 6%) compared to boys (9.6% and 8.2%) respectively.

Association between overweight and obesity and physical activity

The present study reveals that the prevalence of both overweight and obesity were more among those students who did not participated in any of the physical

activities (19.17% and 6.84%). Which were found to be statistically highly significant (p<0.001) (Table-4)

A study done by Goyal RK et al[10] on adolescent school children aged 12-18 years in Ahmedabad in the year 2010 revealed that those students with reduced physical activities like exercise have remarkable effect on the prevalence of overweight and obesity.

A study done by Shylesh R et al[11] among 11-15 year school children in Coimbatore in the year 2011 revealed that 20.5% of obese children had inadequate physical activities.

Association between overweight, obesity and T.V watching

The present study shows that the prevalence of overweight and Obesity was more in those students who watched Television for more than 2 hours in a day (16.43% and 6.84%) followed by those watching less than 7 hours a week(3.89% and 0.00%) respectively. Hence watching T.V was significantly associated with overweight and obesity (p<0.05) (Table-6)

In a study done by shabana T et al[12] among 8-15 year school children in Chennai in the year 2009 revealed that the prevalence of overweight and Obesity was greater in children watching television more than 2 hours(OR -2.5 ,CI-1.1 to 5.4, p <0.0001)

A study done by M Shashidhar et al[7] among 12-15 years adolescent in Mangalore in the year 2010. A multivariate logistic regression revealed that the prevalence of overweight and Obesity was 7.3 times higher in those reported watching television for more than 4 hours a day.

Association between Overweight, Obesity and Snacking

The present study shows that the prevalence of overweight and obesity were high in those students who were consuming junk foods frequently(14.08% and 7.04%)as compared to those groups who were not consuming, which were found to be statistically highly significant (P<0.001)(Table 8)

A study done by Nicklas TA et al[13] 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).

Conclusions

1. The prevalence of overweight and obesity is 10% and 3.34% among school children aged between13-15 years.

2. It was found that the prevalence of overweight and obesity was more in girls compared to boys.

3. The present study found positive association of Overweight and Obesity with age, participation in outdoor sports, participation in physical activity, Duration of T.V watching and media usage and snacking habits.

4. Primary prevention is possible by modifying obesogenic environmental factors such as increased physical activity, dietary modification, behavioral changes etc.

5. Long term studies have shown beneficial effects of life style modifications on reducing the risk of obesity.

Recommendations

1. Health education should be given to the risk portion of the population regarding the causative factors and the consequences of overweight and obesity.

2. Girls should be motivated for household activities; school based physical activities and participation in outdoor sports and games.

3. Right knowledge about the diet and physical activity should be given and brought in to the practice.

4. IEC activities should be given in the schools on the following points to prevent obesity such as

a. Maintain a normal and a healthy weight.

b. Eat variety of foods that are low in fats and avoid eating high calorie foods

c. Avoid eating snacks and fast foods.

d. Have a diet with a plenty of vegetables, fruits, grain products and fiber rich foods.

e. Limit the time spent on TV, videogames, computer viewing to a less than 2 hrs a day.

f. Students should be encouraged to participate in outdoor school games and regular physical activity.

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