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Prevalence of Obesity among Female School Children of Jaipur City

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Abstract
Introduction:*Country like India, is also suffering from problems of overweight and obesity among children, adolescents, adults, and old age. Obesity with associated problems is affecting to all age groups.*
Objectives: *1.To find out and compare the prevalence of obesity among female school children. 2. To find out the relationship between Obesity and Socioeconomic status.*
Material&Method:*For the purpose of the study, total 800 female children were selected randomly from four private schools and four government schools. The age of the children was ranged from 6 to 10 years. In the study two variables were examined namely obesity and socioeconomic status. The data regarding height was obtained by stadiometer and weight by weighing machine. To assess obesity, BMI was calculated by using thestandardized protocol and BMI percentile for age and sex was preferred for detecting overweight or obesity among children. Updated Kuppuswamy SES questionnaire (2015) was used to assess socioeconomic status.*
Results:*The results revealed that the prevalence of Obesity was higher in age group of 9 years among female children of Private schools, and also revealed that Obesity was higher in age group of 6 years age group of female children of Government schools.The prevalence found asobesity 11.37%, overweight9.75%, and underweight 3.25% among female children of Private schools. The prevalence found as obesity 4.5%, overweight 5.5%, and underweight 7.37% among female children of Government schools. Overall prevalence of obesity was higher among female children of private schools in comparison to government schools. Further, significant relation was found between obesity and SES among private schools children, whereas insignificant relationship exists between obesity and SES among government schools children.*
Conclusion: *The present study concluded that obesity somewhat found more in children from private schools may be due to their higher socio economic status, eating habits, lifestyle, time spent on physical activity. It indicates that there is requirement of physical activity and fitness programmes in the schools for betterment of health and wellness of young generation in schools and colleges as well.*
Key Words:*Prevalence, Obesity, Childhood Obesity, Overweight, Socio-economic status, BMI*

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I. INTRODUCTION

In modern scenario, due to increased socio-economic development and urbanization drastic changes emerged in one's lifestyle consisting of more junk or unhealthy food consumption, physical inactivity, improper rest, stress and depression. This overall facilitated to the lifestyle diseases such as obesity, hypertension, diabetes, heart problems. Children.

Country like India, is also suffering from problems of overweight and obesity among children, adolescents, adults, and old age. Obesity with associated problems is affecting to all age groups. Various studies revealed that children who are overweight or obese in their childhood are at more risk to become obese during adulthood.

Socioeconomic status also favour to the epidemic of obesity. SES is a measure of an individual's or family's economic and social position in relation to others. Most of the researchers agree that education, occupation, and income together best represent socioeconomic status of an individual or family, while some other researchers agree that changes in family structure, family effluence etc. should also be considered for assessing SES. Due to high level of occupation, people getting high income and therefore they are living sedentary lifestyle. Some studies were conducted to examine relationship between obesity and SES among adults, but few studies were conducted to assess the relationship among children of age group 6 to 10 years. The main objective of the present study was to examine and compare the prevalence of obesity among female

children of private and government schools and also to assess relationship between obesity and socioeconomic status.

II. MATERIAL AND METHODS

The study was conducted on total 800 female children. Children were selected randomly from eight schools (4 private and 4 Government schools). The age group of children ranging between 6 to 10 years. Obesity and socioeconomic status were main variables of the study. Informed consent was obtained from all eight schools authorities for collection of data. Height and weight was measured using stadiometer and weighing machine.The Girls BMI for-age percentile (Centers for Disease Control and Prevention) was used to assess BMI.UpdatedKuppuswamy SES questionnaire (2015) was used to assess socioeconomic status of the children. The data (parent's income, occupation, and education) was collected from record of the respective schools. We examined the prevalence of obesity in each age group. Group comparisons were performed by ANOVA and Correlation analysis was used to assess the relationship between two variables. The Statistical significance was set at $P< 0{\cdot}05$.

III. RESULTS AND DISCUSSION

Table – I: Mean and Standard Deviation of BMI among Private and Government School Female Children of different Age Level

SCHOOL	AGE	Mean	Std. Deviation	N
PRIVATE	6 Years	60.4250	33.27894	80
	7 years	62.6875	32.67818	80
	8 years	67.6125	27.86382	80
	9 Years	72.4875	32.22193	80
	10 Years	67.2125	30.32136	80
	Total	66.0850	31.45969	400
GOVERNMENT	6 Years	49.6250	33.83892	80
	7 years	44.0000	34.47582	80
	8 years	44.8125	32.71592	80
	9 Years	48.8375	33.52514	80
	10 Years	42.7375	30.80101	80
	Total	46.0025	33.04258	400
Total	6 Years	55.0250	33.89012	160
	7 years	53.3438	34.77041	160
	8 years	56.2125	32.37795	160
	9 Years	60.6625	34.85692	160
	10 Years	54.9750	32.84612	160
	Total	56.0438	33.76999	800

As shown in Table-I, Means and Standard Deviation of BMI in Private School female children of 6 years (60.43 ± 33.28), 7 years (62.68± 32.68), 8 years (67.61± 27.86), 9 years (72.49± 32.22) and 10 years (67.21± 30.32). Further, it was found that 9 year Private school children had greater mean in comparison to 6, 7, 8 and 10 year Private School children.

In other hand, Means and Standard Deviation of BMI in Government School female children of 6 years (49.63± 33.84), 7 years (44.00± 34.48), 8 years (44.81± 32.72), 9 years (48.84± 33.53) and 10 years (42.74± 30.80). Further it was found that 6 year Government school children had greater mean in comparison to 7, 8, 9 and 10 year Government school children.

Table –II: Two-way ANOVA of different Age Level at Private and Government School on BMI

Source of Variance	**DF**	**S S**	**MSS**	**F – VALUE**
School	80661.361	1	80661.361	77.664*
Age	4933.025	4	1233.256	1.187
Interaction	5100.670	4	1275.168	1.228
Error	820494.413	790	1038.601	

*Significant at 0.05 level

With df (4, 790) = **2.38**

It is evident from Table – II that 6, 7, 8, 9 and 10 year on BMI among Private and Government school children differed significantly as the obtained F-value of 5.032 is much more then tabulated F 0.05 (4,790) = 2.38

As the F-ratio was found to be significant, Least Significance Difference (L.S.D.) test of Post-Hoc comparisons was applied to study the significance of difference among 6, 7, 8, 9 and 10 year Private and Government school children and the data pertaining to this is presented in Table – III.

Table – III: Least Significant Difference Post Hoc Test of the Mean of BMI at Different Age Level in Private School

6 Year	7 Year	8 Year	9 Year	10 Year	Md	CD At 5%Level
60.43	62.68				2.25	35.99
60.43		67.61			7.18	35.99
60.43			72.48		12.05	35.99
60.43				67.21	6.78	35.99
	62.68	67.61			4.93	35.99
	62.68		72.48		9.8	35.99
	62.68			67.21	4.53	35.99
		67.61	72.48		4.87	35.99
		67.61		67.21	0.4	35.99
			72.48	67.21	5.27	35.99

*significant at 0.05 level

Table-III revealed that there is significant difference between the paired mean of BMI at different Age level at 6 & 7 Year (2.25); 6 & 8 Year (7.18), 6 & 9 Year (12.05); 6 & 10 Year(6.78); 7 & 8 Year (4.93); 7 & 9 Year (9.8); 7 & 10 Year (4.53); 8 & 9 Year (4.87); 8 & 10 Year (0.4); 9 & 10 Year (5.27) respectively. The highest significant paired mean difference was recorded between 6 & 9 Year (12.05) on the other hand the lowest significant paired mean difference was recorded between 8 & 10 Year (.4). The graphical representation of mean of BMI at different Age Level has been presented in Figure 1.

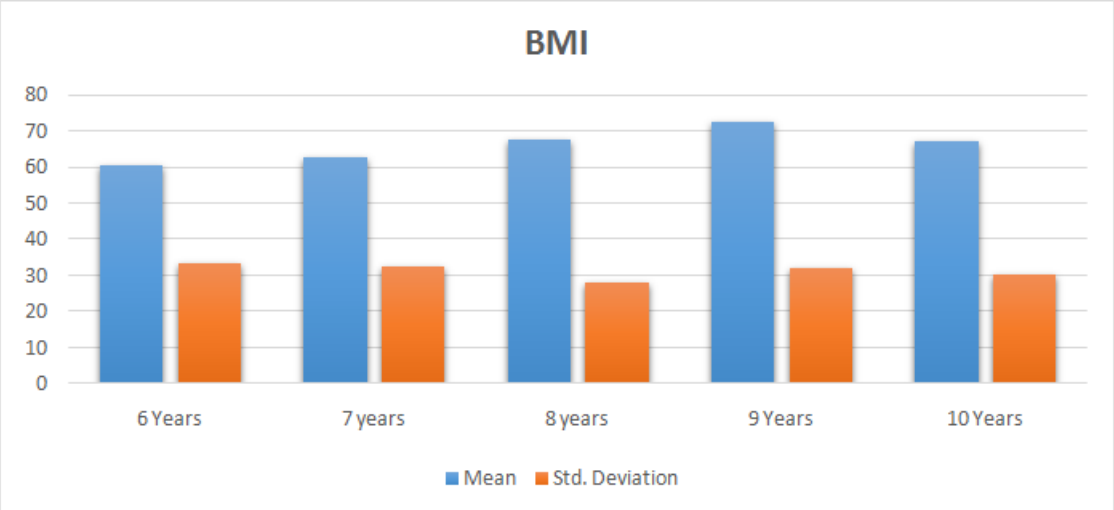

Figure 1 - Mean of BMI at Different Age Level among Female Private School children

Table – IV: Least Significant Difference Post Hoc Test of the Mean of BMI at Different Age Level in Government School

6 Year	7 Year	8 Year	9 Year	10 Year	Md	CD At 5%Level
49.63	44.00				5.63	35.99
49.63		44.81			4.82	35.99
49.63			48.84		.79	35.99
49.63				42.74	6.89	35.99
	44.00	44.81			.81	35.99
	44.00		48.84		4.84	35.99
	44.00			42.74	1.26	35.99
		44.81	48.84		4.03	35.99
		44.81		42.74	2.07	35.99
			48.84	42.74	6.1	35.99

*significant at 0.05 level

Table-IV revealed that there is significant difference between the paired mean of BMI at different Age level at 6 & 7 Year (5.63); 6 & 8 Year (4.82), 6 & 9 Year (.79); 6 & 10 Year (6.89); 7 & 8 Year (.81); 7 & 9 Year (4.84); 7 & 10 Year (1.26); 8 & 9 Year (4.03); 8 & 10 Year (2.07); 9 & 10 Year (6.1) respectively. The highest significant paired mean difference was recorded between 6 & 10 Year (6.89) on the other hand the lowest significant paired mean difference was recorded between 7 & 8 Year (.81). The graphical representation of mean of BMI at different Age Level has been presented in Figure 2.

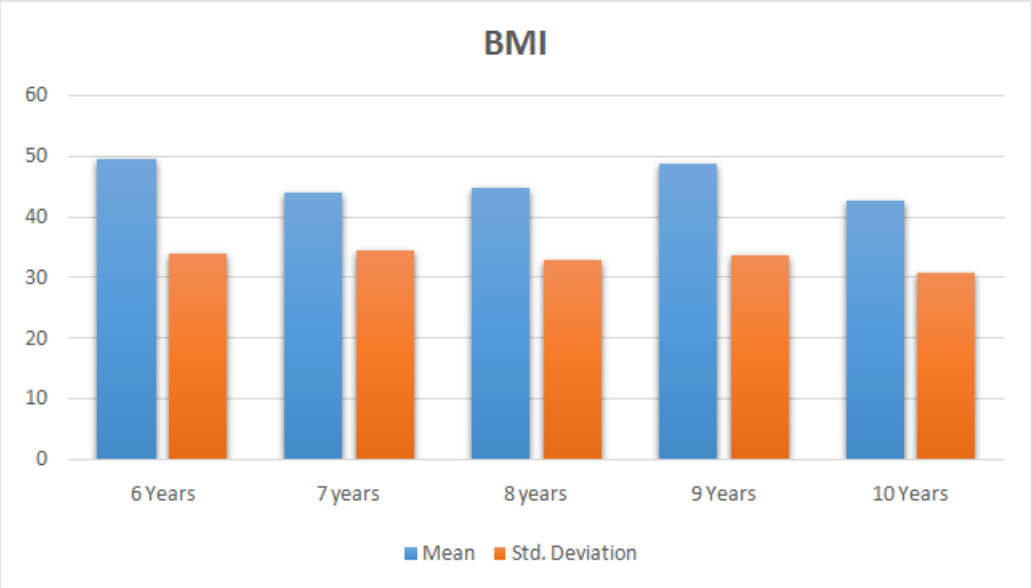

Figure 2 - Mean of BMI at Different Age Level among Government School children

Table – V: Least Significant Difference Post Hoc Test of the Mean of BMI at Different Age Level in Total Private and Government School Children

6 Year	7 Year	8 Year	9 Year	10 Year	Md	CD At 5%Level
55.0250	53.3438				1.6813	17.99
55.0250		56.2125			1.1875	17.99
55.0250			60.6625		5.6375	17.99
55.0250				54.9750	.0500	17.99
	53.3438	56.2125			2.8687	17.99
	53.3438			54.9750	1.6313	17.99
	53.3438		60.6625		7.3187	17.99
		56.2125	60.6625		4.4500	17.99
		56.2125		54.9750	1.2375	17.99
			60.6625	54.9750	5.6875	17.99

*significant at 0.05 level

Table-V revealed that there is significant difference between the paired mean of BMI at different Age level at 6 & 7 Year (1.68); 6 & 8 Year (1.18), 6 & 9 Year (5.63); 6 & 10 Year (.05); 7 & 8 Year (2.86); 7 & 9 Year (7.31); 7 & 10 Year (1.63); 8 & 9 Year (4.45); 8 & 10 Year (1.23); 9 & 10 Year (5.68) respectively. The highest significant paired mean difference was recorded between 7 & 9 Year (7.31) on the other hand the lowest significant paired mean difference was recorded between 6 & 10 Year (.050). The graphical representation of mean of BMI at different Age Level has been presented in Figure 3.

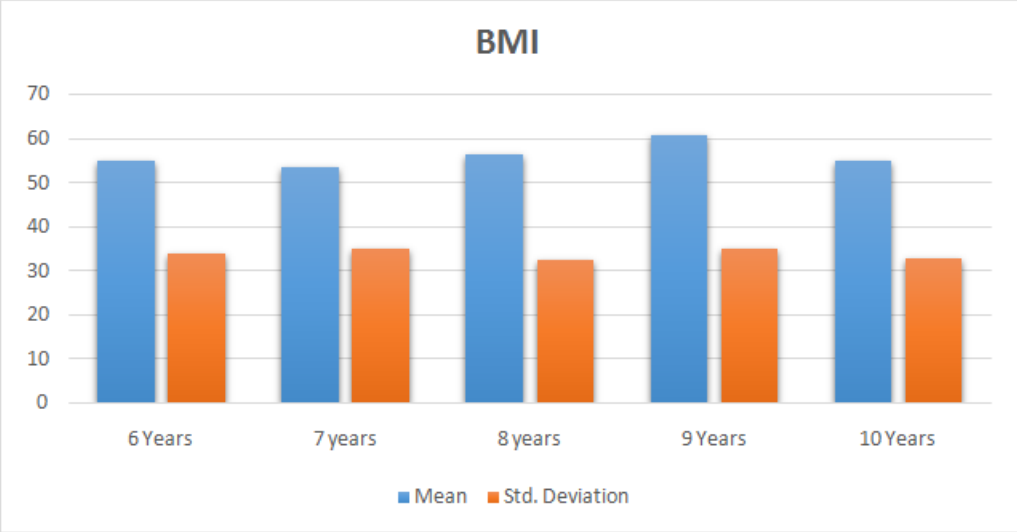

Figure 3 - Mean of BMI at Different Age Level among Private and Government School children

Table – VI: Correlation between Obesity and Socio Economic Status among children of Government and Private School

School	Correlation coefficient
Private School	-.136*
Government School	-.015

* Significant at .05 level

r.05 (800) = .135

Table - VI clearly indicates that there exists a significant relationship between Obesityand Socio Economic Status among children of Private schools as the correlation coefficient values were found higher than the tabulated values at. 05 level of significance.

On the other hand, there exists an insignificant relationship between Obesityand Socio Economic Status among children of Government schoolsas the correlation co-efficient values were found lower than the tabulated values at .05 level of significance.

IV. DISCUSSION

In the present study, it was found that prevalence of overweight and obesity among children of private schools was higher than children of government schools. It was found that the prevalence of Obesity was higher in age group of 9 years among female children of Private schools, and also revealed that Obesity was higher in age group of 6 years age group of female children of Government schools. In the study, on the basis of BMI values it was observed that overweight and obesity was more prevalent among children of private schools in comparison to children of government schools. In the private school, about 11.37% children were overweight, 9.75% were obese, and 3.25% were underweight respectively. On the other hand among government school, about 5.5% children were overweight, 4.5% were obese, and 7.37% were underweight respectively.The prevalence of obesity was alarming in both groups of schools. Therefore, level of physical activity/exercise should be increased among children to overcome the problem of overweight and obesity.

V. CONCLUSION

On the basis of the findings of the present study, it was concluded that in terms of Obesity, significant difference was found between Government and Private schools female children. The prevalence of Obesity was higher in age group of 9 years among group of female children of Private schools, and also revealed that Obesity was higher in age group of 6 years group of female children of Government schools. Overall prevalence of obesity was higher among female children of private schools in comparison to government schools.Further it was revealed that significant relationship was found between Obesity and socioeconomic status among children of Private schools and insignificant relationship between Obesity and socioeconomic status among children of Government schools.The overall prevalence of Obesity and SES was higher among children of Private schools in comparison to the children of Government schools. Due to increasing trend of overweight and obesity among school going children it is crucial to take innovative and quick step to deal with these health issues. The problem of obesity would be resolved with the efforts of both children and their parents in total. So, there should be

programme at primary level to aware the society pertaining the concept, causes and consequences of the Obesity among young population.

VI. RECOMMENDATIONS

Number of hours spent on the Games and Sports activities should be increased among the school children on daily basis. There should be close observation mainly on obese children by the PET, coaches, and instructors during the Sports class period. The Sports or Physical Education teacher should develop some physical activity programme on the basis of the health status of the children suffering from the Obesity condition to control or manage the Obesity. There should be provision of regular health check-up in the schools to monitor health status of children. Special attention should be given to children overall nutrition.

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