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Original Research Paper

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OBESITY AND ASSOCIATED RISK FACTORS AMONG HIGH SCHOOL CHILDREN OF PRIVATE AND MUNICIPAL SCHOOL IN METROPOLITAN CITY.

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ABSTRACT

Background: Obesity in children and adolescents is gradually becoming a major public health problem in many developing countries including India, Worldwide obesity has nearly tripled over 340 million children and adolescents aged 5-19 are overweight or obese, the increase is more in children than adult. The magnitude of overweight ranges from 9% to 27.5% and obesity ranges from 1% to 12.9% among Indian children, more in urban than rural area. The current study was carried out to find out the prevalence of obesity and associated risk factors among school children in selected municipal and private school.

Materials and Methods: The study was conducted in selected municipal and private co-educational schools in Mumbai, Maharashtra, 200 students of 9th standard were selected by Simple Random Sampling technique. Predesigned and pretested questionnaire was used to elicit the associated factors includes family and individual characteristics of study population.

Medical examination was conducted on every Student, it included recording of height, weight, and clinical examination. Height was recorded with the help of stadiometer and weight was recorded using electronic weighing machine with an accuracy of 0.1 kg.

BMI in respect of all the students was computed and compared with the standard BMI- for-age chart of WHO. Overweight considered with BMI is between 23.0- 24.9 kg/m2, and Obesity: >25 kg/m2

Result: The overall prevalence of overweight and obesity was found 8% and 14.5% respectively in high school children, only 37% children were in normal weight. Based on BMI status overweight and obesity were observed 11% and 23% in private school, 5% and 6% in municipal school respectively. There were significant association ofoverweight/obesity with parental qualification; individual risk factors like type of diet, use of junk/fast food, eating habits like eat while watching TV/ mobile, less physical exercise etc. observed among school children.

Conclusions: Children of high school belonging to middle socioeconomic group with less outdoor activities and consuming junk foods were more predisposed to overweight and obesity in urban area. To prevent childhood obesity there is a need to educate to all stakeholders, inculcates healthy life styles among children and encouraging children for more physical activity and by incorporating Health and Nutrition education in school curriculum.

KEYWORDS : BMI, Overweight, Obesity, School children.

INTRODUCTION:

obesity in children and adolescents is gradually becoming a major public health problem in many developing countries including India. The World Health Organization has described obesity as one of today's most neglected public health problems. Overweight and obese are the terms used to describe body weight in excess of what is considered healthy for a particular height [1] .Globally, the prevalence of overweight individuals, including children aged 5–17 years is 10%; however, the prevalence varies according to region [2].International Association for the Study of Obesity (IASO) and International Obesity Task Force (IOTF) reckon that 200 million school children worldwide are either overweight or obese. India, is the third most obese country in the world, is showing increasing incidence of over-weight children and adolescents in urban areas. Latest estimates show prevalence of obesity among adolescents (13-18 years) has grown from 16% to 29% over the last five years [3].

Many countries in South-East Asia including India are going through a rapid demographic, an economic and nutrition transition [4].The nutrition transition is associated with a change in dietary habits, decreasing physical activity and rising prevalence of obesity .Because of this rapid transition, India is now struggling with double burden malnutrition that is, the coexistence of under-weight and micronutrient deficiencies along with overweight and obesity in the same society and even same households. Studies from different parts of India have reported prevalence of childhoodoverweight and obesity in the range of 9-14% and 4-6%. [5]. A sedentary lifestyle with low energy expenditure and consumption of high-calorie foods with low nutritional value are assumed to be the two most important factors responsible for the increasing rate of childhood obesity [6]. Overweight and obesity are major risk factors for a number of chronic diseases, including diabetes, cardiovascular diseases and cancer. Urbanization is the single most important factor associated to obesity in India [7]. Childhood obesity is increasingly being observed with the changing lifestyle of families with increased purchasing power, increasing hours of inactivity due to television, video games, and computers, which are replacing outdoor games and other social activities [8]. Many children in urban region preferred to eat junk food and outside food and have their meals while watching television. Higher prevalence of overweight and obesity was found among children having family history of obesity, intake of high calories junk foods, less physical inactivity, Passive school transport, and television or computer viewing for more than three hours a day were found to be independent predictors for being overweight and obesity [9].

The Wardha study shows a good correlation between physical inactivity and childhood obesity. Kunwar et al. studied the prevalence of obesity in school children in a military station in North-Eastern India and concluded that the prevalence of obesity in garrison schools was lower due to the greater emphasis laid on games and physical activity[10]. To prevent overweight, obesity and metabolic disease in adulthood, there is need to target the children and adolescents, understand the epidemiology and factors influencing body composition in pubertal age groups. Changes in urbanization, environment, lifestyle and accordingly behavior at household and individual levels have been proposed as risk factors for overweight and obesity[11].Mumbai region is

experiencing fast urbanization along with transition in food and activity in children. This study attempted to assess the prevalence of overweight and obesity along with the nutritional profile of the school going children in South Mumbai urban region, and also to prepare an information booklet for school children to create awareness about prevention of obesity.

METHODOLOGY

This was a study including urban school children from municipal and private school in Mumbai district Maharashtra. Two Municipal and two private schools were identified randomly from the list procured from BMC ward Office. 200 adolescent studying in 9th standard were selected as a study unit using simple random sampling technique as per inclusion criteria listed in study. Research tool was developed as per objective of study which includes demographic variable, assessment of obesity and associated risk factor,(reliability coefficient (r=0.96) The theoretical framework for study is based on Health Belief Model by Becker M H and Miaman LA.

After obtaining due approval from School authority, all the children in eligible group were screened for weight, height and estimation of BMI. Predesigned questionnaire was administered to the study participants to elicit the information associated with risk factor includes family and individual characteristics of sample. Class teacher were asked to accompany to the respective classes during the entire screening process.

An anthropometric measurement of weight, height was measured using same calibrated balance and stadiometer by standard technique. Body mass index (BMI) is considered the most comprehensive measure of fatness which defined as the ratio of body weight to body height squared, expressed in kg/m2. BMI was calculated as weight in kilograms /(height in meter)^2[12]. Overweight and obesity was assessed based BMI for age. Children with BMI of 23.0 to 24.9 Kg/m^2 were considered overweight and children with BMI more than 25 Kg/m^2 were considered obese, Normal BMI ranges 18.0-22.9 kg/m^2. Data was recorded on a predesigned study tools. The study protocol was approved by institutes' ethics committee. Data analysis was done by using descriptive statistics

RESULT:

The overall prevalence of overweight and obesity in high school children was found 8 % and 14.5% respectively. Underweight was observed on 40.5% and only 37% children were in normal range of weight as per age. Overweight and obesity was found 11%and 23% in private school and 5% and 6% in municipal school respectively. Higher prevalence of overweight and obesity was observed in high children studying in private school. (Figure No.1) Out of 200 students screened 50% were girls, most of them 72%, and 57% in private and municipal school respectively were belongs to 15 years of age group. 52% students in private and 78% students in municipal schools come to school bywalking every day. Among 18% children in study population from both the schools reported there is history of obesity in family member.

Prevalence of overweight and obesity was 5% and 10% among boys and 6%and 13% respectively among girls of private high school, where as overweight &obesity in Municipal high school was 3% individually among boys and 2% and 3% respectively among girls. Mean score of BMI among children from private was (21.39) and municipal school (18.35) there is significant difference in prevalence of obesity among children from private and municipal school ,there is no difference in prevalence of obesity among boys and girls of both schools .

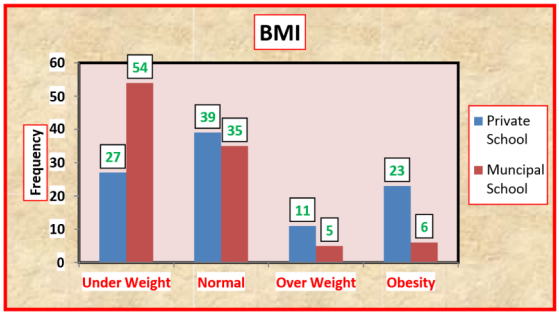

Figure No 1. Distribution of the high school children according to BMI

Association between risk factors and prevalence of overweight/obesity; based on the 'p' value for unpaired t-test subject for demographic variables calculated significant at 0.05 level. It suggests that there is association between prevalence of obesity and religion and qualification of parents. Students attending private schools, and having a father with a business occupation were found to be significantly associated with overweight and obese status. Similarly individual variables like type of diet, consumption of junk/fast food, fried food, more sweets and non-vegetarian food and those children performing less physical activities and watching television/mobile for long period found overweight/ and obese. Factors like Age, Sex, occupation of parent, religion, type of family, and mode of travelling to school were not found to be statistically significant [Table 1& 2].

Table 1: Association Of Obesity With Risk Factors, Demographic Variables.

Sr. No.	Variable	Groups	BMI				Chi χ^2 Square	df	'P' value	Significance
			Under Weight	Normal	Over Weight	Obesity				
1	Age	< 14 yrs	9	10	1	1	3.39	9	0.95	Not Significant
		14-15 yrs	54	51	11	22				
		15-16 yrs	13	10	3	4				
		> 16 yrs	5	3	1	2				
2	sex	Boy	45	34	8	13	1.79	3	0.61	Not Significant
		Girl	36	40	8	16				
3	Religion	Hindu	50	28	4	16	20.44	9	0.02	Significant
		Muslim	17	37	9	10				
		Christian	3	3	0	1				
		Other	11	6	3	2				
4	Type of family	Nuclear	49	39	9	17	3.49	6	0.75	Not Significant
		Joint	30	34	6	12				
		Extended	2	1	1	0				
5	Qualification 0f Father	secondary	63	43	8	10	33.81	9	0.00	Significant
		graduate	12	20	3	17				
		professional	0	4	2	1				
		Other	6	7	3	1				

6	Qualification of Mother	secondary	63	47	11	13	17.65	9	0.04	Significant
		graduate	11	17	3	12				
		professional	0	2	0	2				
		other	7	8	2	2				
7	Mode of transport to school	Bus	22	23	5	10	3.81	9	0.92	Not Significant
		Bicycle	2	5	1	2				
		Walking	57	46	10	17				
8	Occupation Mother	employee	10	8	5	2	11.44	9	0.25	Not Significant
		House wife	68	66	10	23				
		self employed	3	0	1	0				

Table 2. : Association Of Obesity With Risk Factors Diet, Exercise Etc. N=200

Sr. No.	Variable	Groups	BMI as per Age				Chi χ^2 Square	df	P value	Significance
			Under Weight	Normal weight	Over Weight	Obesity				
1	Use of junk food in diet	Yes	20	22	4	0	10.72	3	0.01	Significant
		No	61	52	12	29				
2	Eat very fast	Yes	63	59	14	10	26.17	3	0.00	Significant
		No	18	15	2	19				
3	Skipped snacks	Yes	38	44	7	14	3.07	3	0.38	Not Significant
		No	43	30	9	15				
4	Eat food With TV watching	Yes	25	31	4	4	8.15	3	0.04	Significant
		No	56	43	12	25				
5	Eat food with studying	Yes	52	60	11	21	5.59	3	0.13	Not Significant
		No	29	14	5	8				
6	Sweet and beverages	Never	6	5	1	1	20.95	6	0.00	Significant
		Sometime	53	51	9	8				
		Always	22	18	6	20				
7	Fried food	Sometime	52	51	12	10	14.42	6	0.03	Significant
		Always	29	23	4	19				
	Eggs, chicken and meat	Never	6	3	0	3	13.32	6	0.04	Significant
8		Sometime	20	24	9	3				
		Always	55	47	7	23				
9	play outdoor game	Yes	16	13	7	7	5.63	3	0.13	Not Significant
		No	65	61	9	22				
10	exercise perform	Yes	18	26	6	2	10.41	3	0.02	Significant
		No	63	48	10	27				
11	watching T.V and mobile	Yes	26	9	2	2	14.16	3	0.00	Significant
		No	55	65	14	27				
12	No of Hours engage in physical activity	< 30 min	22	30	5	16	17.86	9	0.04	Significant
		30 min	23	24	4	8				
		1 hour	27	10	6	2				
		> 2 hour	9	10	1	3				

DISCUSSION:

The present study highlights the prevalence of under-weight, over-weight and obesity in adolescent school children. The overall prevalence of overweight and obesity among school children was found to be 8% and 14.5 % respectively. Both overweight andobese were found higher among children of private school (11% and 23 % respectively), than among children of municipal school (5%, 6% respectively). Prevalence of obesity and overweight in both male and female observed more or less same.

Childhood obesity was so far thought to be a problem of the developed world, but it is increasingly being reported from middle- and low-income countries, especially from urban areas. Prevalence of obesity and overweight among children of government school of Pune city was 2.98% and 8.23% respectively. Prevalence of obesity and overweight among children of private school was 8.83% and 12.13% respectively. [9]. A similar study carried out in urban school of Chennai, Tamil Nadu, reported a high prevalence of overweight (8.0-10.81%) and obesity (5.26-9.52%)among children[13].

Every additional hour of TV-time per day increases the prevalence of obesity in children by 2% [14].Watching TV for >2 hr/d was significantly associated with obesity. The National Institutes of Health, US also consider TV-time of >2 hrs as a definite risk for obesity Hours of TV watching also directly correlate with increased intake of foods. Kunwar et al. studied the prevalence of obesity in school children in a military station in North-Eastern India and concluded that the prevalence of obesity in garrison schools was lower due to the greater emphasis laid on games and physical activity.

This Study indicates Children from private schools were at greater risk of being overweight, compared to children in municipal schools, having relatively higher socioeconomic status were found to be significantly associated with overweight and obese status. Children with less physical activities and consuming junk/fast foods were more predisposed to overweight and obesity. Most likely due to associated lifestyle changes leading to inappropriate diet and less physical activity were felt to be important contributors towards overweight and obesity in study population.

To prevent obesity among children there is need to devise meaningful control measures, both home and school-based intervention like education regarding the health, obesity and risk factors, importance of exercise, healthy food and healthy lifestyle etc, to be incorporated in school curriculum. Educating families and stakeholders about healthy eating pattern will help in cutting down on junk food in home and school, therebydecreasing the risk of developing obesity.

Every student should be motivated in increasing physical activity level and participating in the school games.

CONCLUSION:

Obesity in Indian school children is a cause of concern. The high prevalence of overweight and obesity (8%and14.5 %respectively) among school children urban region indicate an urgent need to increase health awareness and motivation of all stakeholder towards inculcating healthy lifestyle among children. As a preventive strategy, there is a need to apply health and nutritional education programs and incorporating more outdoor activities in school curriculum.

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