"A Cross Sectional study of the Prevalence of Obesity among School Children in a Etawah District."

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Abstract:
Introduction: *India is going through the phase of nutritional transition with an under nourished predominant rural society on one end and overweight and obese urban society on the other end.*
Objectives:
* *To find out the prevalence of obesity among school children.*
* *To find out the correlates of obesity*

Material & Method: *A List of all the students of class 6th -10th is gathered from the office of principal of selected school. The necessary information was collected using a pretested structured questionnaire. The information regarding weight, height and BMI was calculated using a standardized protocol.*
Result: *A total of 1044 student participated in the study. Most of the participants were of the age group of 14 and 15 years and were having weight in the range of 30-40 kg and height in the range of 100-145cms. Male participants were more obese as compared to female participants. Overweight and obesity was more prevalent among participants of private school as compare to students of government school.*
Conclusion: *The study also concludes that the obesity pattern among children residing in the small towns and city is some what similar to that of children living in big cities. It indicate the traditional hard working society to a more sedentary life style*
Key words: *Childhood Obesity, Knowledge of Obesity, Activity associated with Obesity.*

I. Introduction:

India is going through the phase of nutritional transition with an under nourished predominant rural society on one end and overweight and obese urban society on the other end. The prevalence of obesity in India in the age group of 9-15 years range from 9.9% to 18.5%.[1] The prevalence of obesity is more common in the urban society of big cities and metropolitan cities than the rural society as noted by different researchers.[2-9]

Studies have also shown some gender difference in the prevalence of obesity with more prevalence of obesity and overweight among boys of affluent society (12.4% and 15.7%) compared to girls (9.9% and 12.9%).[2-5]

Increase in the prevalence of childhood obesity is not only associated with increase prevalence of adult obesity but also with the morbidities associated with it.[6] An in-depth knowledge of obesity & overweight is imperative among school children as a primordial and primary level prevention as suggested by the different researchers. Although various studies have been carried out in India about the assessment of obesity among school children in major cities and metropolitan cities, very few studies have been carried out for the assessment of obesity among children in small cities and town.

So, the present study is designed with the objectives
* To find out the prevalence of obesity among school children.
* To find out the correlates of obesity

II. Material & Method:

Study design : Cross Sectional Study
Study period : Two months (Aug & Sept 2015)
Sampling Universe: All the school having class VI th to X th std.

Sampling frame: All the student in the class VIth to X[th] std in the selected school.

Methodology: A list of all the school was obtained from the office of District Education Society. The list was divided into two namely- government sector and private sector. From each sector one school was selected randomly.

After taking all the necessary approval a list of all the student of class VIth to Xth was obtained. A day for the examination and interviewed was fixed for each classes. The day was communicated to all the students and they were asked to be present on that day.

A pretested structured questionnaire was used for the data collection. The questionnaire was divided into two parts namely socio demographic profile and anthropometric measurement.

Under the section of Socio Demographic profile we gathered information about the name, age, sex, father and mother qualification and father and mother occupation.

Anthropometric measurement: Information was collected about the height and weight of the students and subsequently Body Mass Index (BMI) was calculated using the formula

BMI= Weight(Kg)/height (m^2)

Weight was collected with minimum accepted cloths using a bathroom scale weighing machine with an accuracy up to 100gms. The machine was standardized using a known weight and it was check for the accuracy after every 20 reading.

Height was recorded with a standiometer of maximum length of 5m. The participants were asked to stand bare foot on a standiometer with the back facing the measuring scale. With a head straight a marked was made on the scale and the student was asked to move away from the standiometer

All the data gathered were transferred into Microsoft Excel software and descriptive statistics was applied for its analysis. The association was established using chi square test.

III. Result:

A total of 1064 students were listed from all the section of both the schools. Of this 442 were from government school and 622 were from private schools. Of 1064 students, only 1044 students actually reported for the study (432 from government school and 612 from private school). Thus the final sample was limited to 1044 only. In the present study majority of the participants were of the age group of 14 and 15 years and majority of the parents were graduates (Table1)

Most of the students were having weight in the range of 30-40 kg and height in the range of 100-145cms (Table II)

Classification of students into Obese, Overweight, Normal and Underweight.

Of the 1044 student who participated in the study were classified into underweight, normal, overweight and obese using WHO growth standard 2007. The values between 85th percentile and 97th percentile were classified as overweight and values above 97th percentile were used as obese using WHO growth standard 2007. Thus In the present study 118 students were overweight and 14 students were obese using the above criteria.

On sex wise division it was found that overweight and obese were more prevalent among male students (69 and 9resp.) compared to female students (49 and 5 respectively.).Similarly on school wise comparison, it was found that both overweight and obese were more common among private sector school as compared to government schools (89 and 9 vs. 29and 5 respectively) (Table III)

On using the 5th percentile as the cut off of WHO growth standards 2007 and value below it were considered as underweight, it was found that in the present study 318 students were underweight. Again, on sex wise and school wise comparison it was found to be more among female students (178) were underweight as compared to male students (140). On school wise comparison it was found more in private sector school (206) as compared to government sector school (112).

IV. Discussion:

Socio demographic Profile and Prevalence of Obesity:

The present study has reported the prevalence of overweight and obesity to be around 12.6 % (132). This is inline with the findings of Jagadesan S et al[4] and Kar S et al[6]

The present study has noticed a higher prevalence of obesity among private school as compared to the children of government school. This difference can be attributed to the difference in the lifestyle, eating habits and socio economic status of the private school. However this difference is not significant in the present study. Other researcher have also reported such differences in their study. [4,6,10-11].

On sex wise division, overweight and obesity was more prevalent in the male children as compared to female children. This is again in line with the findings of other researchers like kar S et al.[6] The prevalence of obesity in the girls mostly take place in late puberty when the hormonal effect take place thus resulting in the

redistribution of fats and secondary sexual character take place. However, again in the present study this difference is not statistically significant probably due to small sample size.

On evaluation of data related to under nutrition, it was noted that in the present study that 25.7%(269) of the study participants were under weight. Under weight was more prevalent among females, 159(30.9%) as compared to males,110(20.7%). This difference in the prevalence of obesity between male and female children could be attributed to the difference in the eating habits as well as hormonal effect. On school wise distribution, it was noted that most of the participants were from private school . These finding are similar to the findings of other researchers like Kotian MS[12]et al in south Karnataka.

On evaluation of the sociodemographic profile of the participants it was noted that majority of the participants were in the age group of 14-15 years. Most of the parents in both the group were literate. On evaluation of employment status it was noted that father of nearly all the children were employed and mother were house wife.

V.   Conclusion:

The study also concludes that the obesity pattern among children residing in the small towns and city is some what similar to that of children living in big cities. This indicates the shift of the from the traditional hard working society to a more sedentary life style and more use of food having high quantity of fats.

References:

[1].   National Health programs of India. J Kishore. 11th Edition, Century Publication, New Delhi, 2014.204-05.
[2].   Parekh A, Parekh M, Vadasmiya D. Prevalence of Overweight and Obesity in Adolescent of Urban & Rural Area of Surat, Gujarat. National Journal of Medical Research, 2012;2(3):325-29.
[3].   Mangalathil TX, Kumar P, Choudhary V. Knowledge and attitude regarding obesity among adolescent students of Sikar, Rajasthan. IOSR-JNHS, 2014; 3(2):44-48.
[4].   Jagadesans S, Harish R, Miranda P, Unnikrishnan R, Anjana RM, Mohan V. Prevalence of Overweight and Obesity Among School Children and Adolescents in Chennai. Indian Pediatrics, 2014;51:544-49.
[5].   Jacob S K. Prevalence of Obesity and Overweight among School Going Children in Rural Areas of Ernakulam District, Kerala State India. International Journal of Scientific Study, 2014;2(1): 16-19
[6].   Kar S, khandelwal B. Fast foods and physical inactivity are risk factors for obesity and hypertension among adolescent school children in east district of Sikkim, India. Journal of Natural Science, Biology and Medicine,2015; 6(2): 356-59.
[7].   Parekh A, Parekh M, kumar VD. Prevalence of Overweight and Obesity in Adolescent of urban & Rural Area of Surat, Gujarat. NATIONAL JOURNAL OF MEDICAL RESEARCH., 2012;2(3): 325-29.
[8].   Chhatwal J, Verma M, Riar SK. Obesity among pre-adolescent and adolescents of a developing country (India). Asia Pac J Clin Nutr 2004;13:231-5.
[9].   Ramachandran A, Snehalatha C, Vinitha R, Thayyil M, Kumar CK, Sheeba L, et al. Prevalence of overweight in urban Indian adolescent school children. Diabetes Res Clin Pract 2002;57:185-90.
[10].   Kapil U, Singh P, Pathak P, Dwivedi SN, Bhasin S. Prevalence of Obesity Amongst Affluent Adolescent School Children in Delhi. Indian Pediatrics 2002; 39:449-452
[11].   Marwaha RK, Tandon N, Singh Y, Aggarwal R, Grewal K, Mani K. A study of growth parameters and prevalence of overweight and obesity in school children from delhi. Indian Pediatr 2006;43:943-52.
[12].   Kotian MS, Kumar SG1, Kotian SS. Prevalence and Determinants of Overweight and Obesity Among Adolescent School Children of South Karnataka, India. IJCM ,2010; 35(1):176-78.

Tables
Table 1: Distribution of the participants on the basis of Socio Demographic Profile

S. No	Determinant	Gov.(432)		Pvt(612)		Total(1044)	
		Male (206)	Female (226)	Male (324)	Female (288)	Male (530)	Female (514)
1	Age:						
	<=11 year	22	20	31	26	53	46
	12 Year	27	36	53	56	80	92
	13 year	36	43	52	60	88	103
	14 year	41	40	76	69	117	109
	15 year	52	64	57	49	109	113
	>=16 year	28	23	55	28	83	51
	Total	206	226	324	288	530	514
2	Fathers Education:						
	Illiterate	17	16	36	29	53	45
	Upto 5th	19	22	39	44	58	66
	Upto 10th	27	28	35	38	62	66
	Upto 12th	31	44	59	53	90	97
	Graduate	66	64	94	77	160	141
	Post graduate / professional	46	52	61	47	107	99
	Total	206	226	324	288	530	514
3	Mothers Education:						
	Illiterate	29	39	41	46	70	85
		47	43	53	41	100	84

	Upto 5th	37	44	64	43	101	87
	Upto 10th	33	43	83	61	116	104
	Upto 12th	41	46	61	36	102	82
	Graduate	19	11	22	61	41	72
	Post graduate / professional						
	Total	206	226	324	288	530	453
4	Fathers Occupation:						
	Unemployed	18	16	26	33	44	49
	Skilled worker/ Shopkeeper	66	88	144	118	210	206
	Service(Govt/ Pvt.)	82	75	103	95	185	170
	Professional s	40	47	51	42	91	89
	Total	206	226	324	288	530	514
5	Mother s Occupation:						
	Unemployed/ house wife	133	149	266	206	399	355
	Skilled worker/ Shopkeeper	5	8	3	9	8	17
	Service(Govt/ Pvt.)	52	58	43	56	95	114
	Professional s	16	11	12	17	28	28
	Total	206	226	324	288	530	514

Table II: Distribution of the participants on the basis of weight, Height and BMI

S. No	Determinant	Gov.(432)		Pvt(612)		Total(1044)	
		Male (206)	Female (226)	Male (324)	Female (288)	Male (530)	Female (514)
1	Weight(in Kg)						
	>30	15	24	17	23	32	47
	30-32.9	26	59	53	83	79	142
	33-34.9	54	48	88	74	142	122
	35-36.9	37	38	96	56	133	94
	37-38.9	36	29	39	29	75	58
	39-41.9	25	14	23	21	48	35
	≥42	13	14	8	2	21	16
	Total	206	226	324	288	530	514
2	Height(In cms)						
	>100	13	21	16	23	29	44
	100-115	36	53	59	83	95	136
	116-130	49	61	89	76	138	137
	131-145	43	41	76	63	119	104
	146-160	29	25	39	25	68	50
	161-175	22	14	29	11	51	25
	≥176	14	11	16	7	30	18
	Total	206	226	324	288	530	514
3	Body Mass Index(BMI)						
	>15	9	16	20	37	29	53
	15-15.9	36	48	45	58	81	106
	16-16.9	34	64	53	68	87	132
	17-17.9	66	51	74	63	140	114
	18-18.9	39	31	64	36	103	67
	19-19.9	15	11	43	15	58	26
	20-20.9	5	5	16	8	21	13
	≥21	2	0	9	3	11	3
	Total	206	226	324	288	530	514

Table III: Distribution of the participants on the basis of Overweight & obesity

s. no	Determinants	overweight	Obese	χ2 and p value
1	Sex Wise			
	Male	69	9	$\chi^2=0.17$ df =1
	Female	49	5	p=0.675
	Total	118	14	
2	School wise			
	Private	89	9	$\chi^2=0.81$ df =1
	Government	29	5	p=0.367
	Total	118	14	