



Original Research Article

Impact of Dietary Habits on Prevalence of Obesity in Children Aged 5-17 Years

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ABSTRACT

BACKGROUND: Obesity is the result of an imbalance between energy intake and energy expenditure. Increasing urbanisation in traditionally rural societies is associated with changed pattern of diet, physical activity and body composition. Controversial information exists about the strongest energy balance aspects influencing body fatness.

OBJECTIVE: To study the impact of eating habits on the prevalence of obesity in school going children aged 5-17 years.

DESIGN: Cross sectional descriptive study.

METHODS: The present study was conducted in 10000 students aged 5-17 years of randomly selected 20 schools of Amritsar. All children were asked about dietary habits on a pre planned questionnaire and BMI was calculated to measure obesity. The information regarding the eating habits, intake of fast foods and daily caloric intake was collected.

RESULTS: No significant difference was found between energy intake per day of obese and non obese children. The percentage of children taking fast foods and regularly eating in between meals (snacking) was significantly higher in the obese children, when compared to non obese children.

CONCLUSION: Intake of fast food, sugar sweetened beverages and snacking on ready prepared food has direct correlation with increasing body fatness. Association of a sedentary lifestyle and genetic predisposition needs to be evaluated in further studies.

KEY WORDS: Obesity, Eating, Fast Food, Caloric intake

INTRODUCTION

Prevalence of overweight and obesity is increasing worldwide. Obesity in children and adolescents may have social and psychological consequences on adolescent health. Stigmatization of obese children and adolescents has long been recognized in Westernized cultures. At present the potential public health issue that is emerging is the increasing incidence of childhood obesity in developing countries and the resulting socioeconomic and public health burden that will be faced by these countries in the near future. Many studies have shown that the prevalence of overweight among children and adolescents varies between 10 and 30% [1-3] the risk of overweight is higher among the adolescents of high SES, among those participating < two hour/week in any type of physical activity, among those who reported watching television and playing games on the computer for \geq four hours/day and among those who ate chocolates daily in addition to a normal diet. [4] the pleasant mouth feel of fat when eaten causes a stimulatory effect on energy intake. [5] Excessive carbohydrates in the body can also be converted into fats. reports that about 60-80% of excess energy may be stored on carbohydrate overfeeding. [6] Dietary fat has a higher energy density than other macronutrients and this is largely responsible for the overeating effect, or passive overconsumption as is experienced by many subjects to high fat foods. [7] Fast foods may not be entirely satisfying and are often used as an addition to regular diet, thus increasing the energy intake.

MATERIAL AND METHODS

A cross-sectional study was conducted in 20 schools located in rural and

urban field practice areas of Department of Paediatrics, Sri Guru Ram Das Hospital, Amritsar. 10 schools each were selected randomly from rural and urban areas, out of which 5 were government and 5 were private schools. During visit to each school, after collecting basic identification data, the students aged 5-17years were examined and their weights and heights were measured. The body mass index was calculated according to the formula: $BMI = \text{weight (kg)} / \text{height}^2 \text{ (m}^2\text{)}$.

The obesity was classified in terms of BMI as follows:

BMI 25.0-27.4=Overweight and
Above BMI 27.4 =Obesity

To find relations between dietary factors and childhood obesity information regarding details of eating patterns or different types of foods was collected on a pre structured questionnaire that included questions on: meal patterns and meal frequency, snacking and beverage consumption, fast food intake, portion sizes, etc.24 hour recall method was used as the tool for measuring the average daily intake of food in the study population. The data was collected and analyzed using SPSS-17. For all statistical tests, a p-value of >0.05 was considered non significant, a p-value of <0.05 was considered significant and a p-value of <0.001 was considered highly significant.

RESULTS AND DISCUSSION

Of the 10000 school children studied in the present study, 189 children were found to be obese; the prevalence rate of obesity is 1.89%.

Table I shows the prevalence of snacking (eating in between meals) among the obese and non obese children.

**TABLE – I:
EATING IN BETWEEN THE MEALS IN OBESE AND NON-OBESE CHILDREN**

Snacking	Obese		Non-Obese	
	No.	%age	No.	%age
YES	136	71.96	6373	64.96
NO	53	28.04	3438	35.04
Total	189	1.89	9811	98.11

(P < 0.05 Significant)

Out of the total study population 6509, children (65.09%) were found to eat in between the major meals of the day. 3491 (34.91%) children refrained from in between snacking and ate only at 3 major meals of the day. Among the obese children, (136) 71.95% children were used to eating in between meals, whereas this number was lower among the non-obese (64.96%). The difference was found to be statistically significant (p < 0.05). This was earlier documented by Drummond S et al, [8] who associated regular snacking between meals with increased overall dietary intake in

affluent societies. But Verboket Van de Venne WP et al [9] found no effect of meal patterns on energy metabolism and energy balance. For each additional serving of sugar sweetened drink consumed in school children, both the BMI and the frequency of obesity increased. [10] Cross-sectional studies have found correlations between being overweight in childhood and buying lunch at school, eating supper while watching television or without family supervision, consuming less energy at breakfast or more at dinner, and missing breakfast. [11]

**TABLE – II:
FAST FOOD INTAKE IN THE STUDY POPULATION**

Intake of fast food	Obese		Non-Obese	
	No.	%age	No.	%age
DAILY	54	28.57	1142	11.64
OFTEN	66	34.92	2586	26.36
RARELY	69	36.51	6083	62.00
Total	189	1.89	9811	98.11

(P < 0.05 Significant)

In the study population, 6152 (61.52%) children were found to be rarely eating fast foods. 2652 (26.52%) children often ate fast foods, whereas only 11.96% of the study population ate fast foods daily. Among the obese, 54 (28.57%) of children ate fast foods daily whereas only 11.64% of

the non-obese ate fast foods daily. 66 (34.92%) of the obese children often ate fast foods which was higher than the non-obese. 69 (36.51%) of the obese children rarely ate fast foods, which is significantly lower than 62.0% of the non-obese eating fast foods rarely (p < 0.0001). The difference in intake

of fast foods among the obese and non-obese was found to be statistically highly significant. This can be well explained by the fact that fast foods are high in fat and energy dense. Laboratory experiments in animals and clinical studies in human beings have repeatedly shown that dietary factors particularly the level of fat and weight gain is closely associated. Ready-prepared / fast foods are making increasingly large contributions to the energy intake of children and adolescents around the world. [12] It has been widely reported that limiting fast foods and sweetened beverages, which are particularly energy dense, may help control obesity in childhood. [13] Previous studies as in Greece have also reported that, overweight adolescents consumed more snacks (potato chips, chocolate bars, pizza, cheese pie, and cream pie), more sugar, jam,

and honey, and fewer legumes, vegetables, and fruits than their non-overweight counterparts. [14] In a study on U.S. children, it was observed that sugar-sweetened beverages obtained at school contributed a daily mean of 29 kcal in middle school children and 46 kcal in high school children across all school children. Attending a school without stores or snack bars was estimated to reduce sugar-sweetened beverage consumption by 22 kcal per school day in middle school children ($P < 0.01$) and by 28 kcal in high school children ($P < 0.01$). [15]

Table III shows the mean and standard deviation values for the daily oral intake in both the obese and non-obese group of school going children (kcal /day).

TABLE – III
DAILY CALORIC INTAKE OF THE OBESE AND NON-OBESE CHILDREN

Age (yr)	Caloric Intake in Obese (kcal/day)		Caloric Intake In Non Obese (kcal/day)	
	Mean	SD	Mean	SD
5	1307.70	142.07	1214.66	156.50
6	1488.30	225.40	1340.75	179.40
7	1558.75	221.80	1491.13	168.70
8	1596.15	207.80	1545.00	174.50
9	1854.17	342.10	1667.61	271.23
10	2030.00	365.50	1766.74	280.58
11	2131.82	373.20	1958.30	274.13
12	2156.67	336.00	2081.85	262.33
13	2211.67	321.10	2113.05	225.89
14	2248.00	280.90	2127.18	203.89
15	2373.30	311.20	2162.18	224.66
16	2388.24	313.50	2202.31	251.30
17	2505.00	421.30	2242.36	284.40
Total	2055.24	454.40	1842.30	395.00

($P > 0.05$ Not Significant)

The mean caloric intake per for all age groups was statistically insignificantly higher in the obese children, as compared to the non-obese children ($p > 0.05$). The mean caloric intake/day of the obese children was 2055.24 Kcal/day, whereas the mean caloric intake/day of the non-obese was 1842.30 Kcal/day. The difference was found to be statistically insignificant ($p > 0.05$). Earlier studies showed similar observations and reported no difference between obese and non-obese population when energy intakes were compared and concluded that obesity was not caused by overeating in adults or children. ^[16,17] Genetic susceptibility is known to be an important factor in weight gain in people with comparable energy intakes. Genetic predisposition to obesity was observed in animal models and it may as well exist in humans. ^[18] Energy intake measured by self report as in the present study showed no difference between the obese and non-obese. But self report may not be a valid measure of energy intake because obese children may underreport energy intake to varying degrees. ^[19,20]

CONCLUSION

It was concluded that fast food intake and eating in between the meals are significantly high in the obese children. As the difference in calorie intake per day show no significant difference, it is concluded that obesity is a disease of lifestyle, resulting from unhealthy eating practices and decreased physical activity. It is recommended that limiting fast food intake and snacking may help curb obesity in children.

CONTRIBUTION OF AUTHORS

Both the authors were involved in the concept, design, data collection, analysis and drafting of the manuscript.

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