

## **Lifestyle Pattern and Prevalence of Obesity among School Children in Chennai City (10-17 Years)**

Rajkala. A<sup>1</sup>, K. S. Kumari<sup>2</sup>

<sup>1</sup>Research Scholar, Department of Food and Nutrition, Bharathiar University, Coimbatore, India.

<sup>2</sup>Research Guide, Director, Sree Sankara College, Kalady, Ernakulum Dist, Kerala, India

Corresponding Author: Rajkala. A

### **ABSTRACT**

Obesity and overweight pose a major risk for serious diet-related chronic diseases, including type 2 diabetes, cardiovascular disease, hypertension and stroke, and certain forms of cancer that reduce the overall quality of life. Of special concern is the increasing incidence of child obesity. Increased consumption of more energy-dense, nutrient-poor foods with high levels of sugar and saturated fats, combined with reduced physical activity, have led to obesity rates that have risen three-fold and more. The obesity epidemic is not restricted just to the industrialized societies and developed countries; it is much faster in developing countries like India. Hence, in the present study, an attempt was made to investigate the prevalence and relationship between lifestyle factors such as physical activity and dietary pattern of school going children on obesity. The study consisted of 215 children, consisting of both boys and girls in the age group of 10-17 years. The socio-demographic profile, anthropometric measurements, physical activity pattern, snacking habits and dietary habits were obtained from the selected subjects. The findings revealed that 22.79 percent of the children were either overweight/obese. The children had the habit of skipping meals prepared at home, snacked on junk foods in-between meals and also while watching television, craved for sweets and chocolates and ate unhealthy foods almost every day. The usage of computers, mobile phones and television viewing time was high and the physical activity was low. Hence a multi-disciplinary approach is required at all levels to bring about a change in the minds of the society in reducing malnutrition.

**Key words:** childhood obesity, metabolic syndrome, over-weight, obese, urbanization, life-style disorder, non-communicable diseases.

### **INTRODUCTION**

Obesity is a challenging multi-factorial problem increasing at an alarming rate across the globe in all age groups. <sup>[1]</sup> The World Health organization <sup>[2]</sup> defines obesity as a 'global epidemic'. It is estimated that around 400 million people are suffering from obesity in which 84 million were teenagers.

Traditionally, a fat child was considered as an 'attractive' child, and was often referred to as a 'healthy' child. However, the adverse and serious consequences of childhood obesity are now

proven beyond doubt. <sup>[3]</sup> Childhood obesity is strongly associated with cardiovascular diseases, diabetes, orthopedic problems, mental disorders, non-alcoholic fatty liver disease and sleep-associated breathing disorders as they age. <sup>[3]</sup> Obese children often suffer from stigmatization <sup>[4]</sup> and 50-80 percent of them will continue as obese adults. <sup>[5]</sup>

Globally, the prevalence of childhood obesity has risen in recent years. The International Association for the Study of Obesity (IASO) and International Obesity Task Force (IOTF) estimated that 200

million school children are either overweight or obese. [6] Ogden *et al* [7] reported that the percentage of obese children in the US (6-11 yr age group) was 7 per cent in 1980 which increased to 20 per cent by 2008. Parallely, among adolescents (age groups of 12-19 yr) obesity rates increased from 5 to 18 per cent. Recent figures from the IOTF website (2013) showed prevalence rates of overweight/obesity as 40 per cent in both genders in US. Studies conducted on childhood obesity suggest that it may be plateauing off in some developed countries, while steep increases continue to occur in developing countries. [8,9] However, these trends are not well documented.

Economic growth has made developing countries such as India more prone to lifestyle disorders. This is due to physical inactivity and intake of calorie dense food associated with urbanization, modernization, [10] globalization, rural-to-urban migration and mechanization, finally resulting in double burden of 'under nutrition' and 'obesity' in developing countries. [11,12] This has resulted in nutrition transition, which in turn contributes to the prevailing increasing trend in childhood obesity. Studies from different states of India suggested that the prevalence of obesity ranged from 10 – 50 percent. [10]

Obese children have substantial risks for morbidity such as hypertension and dyslipidemia even before they reach adulthood. [13] Importantly, 50 to 80 percent of obese children become obese adults and all complications of adult obesity are made worse if the obesity begins in childhood. [5] Type 2 diabetes is also beginning to emerge in children.

A recent longitudinal study from Pune, India, found a significant positive correlation between the BMI of children at 8 and 21 years. Those in the highest quartile of BMI at 8 years had a relative risk of 2.87 of remaining in the same quartile at 21 years of age. [14] Apart from BMI, waist circumference and skin fold thickness also showed a similar pattern of tracking. [14]

Since the amount of body fat per se is difficult to determine exactly, for practical use, percentage overweight or the body mass index (BMI) or waist-hip ratio are used to classify and to identify obesity in persons.

The role of food industries across the world is also an important concern due to introduction of food products such as processed foods and canned foods that are rich in fat and sugar with an adoption to the local consumers. [15] Obesity thus plays a vital link in the web of causation of most of the non-communicable diseases. [16]

## **MATERIALS AND METHODS**

### **Ethics**

The study was conducted after obtaining clearance from the institutional ethical committee members of the college. Prior consent was also obtained from the school as well as the human subjects for participation in the study.

### **Study design**

The study was conducted among children in the private schools in Chennai City. Two hundred and fifteen children in the age group of 10-17 years were screened for prevalence of obesity. They were given structured questionnaire to obtain information on their socio-economic status, family history and lifestyle pattern. Height was measured in centimeters (cm) using a stadiometer. Weight was measured in kilograms (Kg) using a standardized weighing machine. Body mass index (BMI) was calculated using the formula: weight (Kgs) divided by height in square meters ( $m^2$ ). Waist circumference was measured in centimeters using a non-stretchable fiber measuring tape. Statistical analysis was done using statistical analysis software (SPSS). Pearson's Chi square and T test was done to find out the significant difference between variables.

## **RESULTS**

The overall prevalence of overweight/ obesity among school going children was found to be 22.79 percent.

Among boys 8.5 percent were overweight, 7.2 percent were in grade I obesity and 4.2 percent were grade II obesity. Similarly among girls, 7.4 percent, 10.7 percent and 6.6 percent were overweight, grade I, and grade II obesity respectively.

Table 1 shows the dietary pattern of the selected children. It is clear that majority

of the children were non-vegetarians and many of them were yo-yo eaters- sometimes very healthy and other times very unhealthy, consumed more food when they felt bored or stressed, craved for sweets and chocolates, ate foods even when they were not hungry.

| Particulars                               |                                | Frequency | percent |
|---|--------------------------------|-----------|---------|
| Dietary pattern                           | Vegetarian                     | 26        | 12.1    |
|   | Non - Vegetarian               | 182       | 84.7    |
|   | Ova –vegetarian                | 7         | 3.3     |
| Intake of soft drinks / aerated beverages | Always (almost daily)          | 22        | 10.2    |
|   | Sometimes (weekly once/ twice) | 148       | 68.8    |
|   | Never                          | 45        | 20.9    |
| Skipping of foods prepared at home        | Always (almost daily)          | 23        | 10.7    |
|   | Sometimes (weekly once/ twice) | 88        | 40.9    |
|   | Never                          | 104       | 48.4    |
| Snacking in-between meals                 | Always (almost daily)          | 41        | 19.1    |
|   | Sometimes (weekly once/ twice) | 108       | 50.2    |
|   | Never                          | 66        | 30.7    |
| Snacking while watching TV                | Always (almost daily)          | 55        | 25.6    |
|   | Sometimes (weekly once/ twice) | 121       | 56.3    |
|   | Never                          | 39        | 18.1    |
| Yo-Yo eaters                              | Always (almost daily)          | 38        | 17.7    |
|   | Sometimes (weekly once/ twice) | 93        | 43.3    |
|   | Never                          | 84        | 39.1    |
| Eating more food when bored/ stressed     | Always (almost daily)          | 18        | 8.4     |
|   | Sometimes (weekly once/ twice) | 52        | 24.2    |
|   | Never                          | 145       | 67.4    |
| Trying new foods by seeing advertisements | Always (almost daily)          | 24        | 11.2    |
|   | Sometimes (weekly once/ twice) | 87        | 40.5    |
|   | Never                          | 104       | 48.3    |
| Craving for sweets and chocolates         | Always (almost daily)          | 34        | 15.8    |
|   | Sometimes (weekly once/ twice) | 121       | 56.3    |
|   | Never                          | 60        | 27.9    |
| Consumption of unhealthy foods            | Always (almost daily)          | 57        | 26.5    |
|   | Sometimes (weekly once/ twice) | 85        | 39.5    |
|   | Never                          | 73        | 34.0    |
| Visiting food outlets with friends        | Always (almost daily)          | 8         | 3.7     |
|   | Sometimes (weekly once/ twice) | 80        | 37.2    |
|   | Never                          | 127       | 59.1    |
| Consumption of supersized portion         | Always (almost daily)          | 12        | 5.6     |
|   | Sometimes (weekly once/ twice) | 63        | 29.3    |
|   | Never                          | 139       | 64.7    |

Many of the parents provided pocket money for their children (Figure 1). Majority of the children utilized this money for buying snacks such as bakery foods, chips, chocolates, ice-creams, aerated drinks and fried foods from the school canteen and nearby shops.

Table shows the habit of dining outside among the children with the pocket

money obtained from the parents. It was significantly shown that the children spent money for dining outside (Table 2), along with their friends, as the pocket money increased. They preferred places such as fast food outlets, restaurants, roadside dhabbas, biryani shops and others such as bakeries and ice cream parlors.

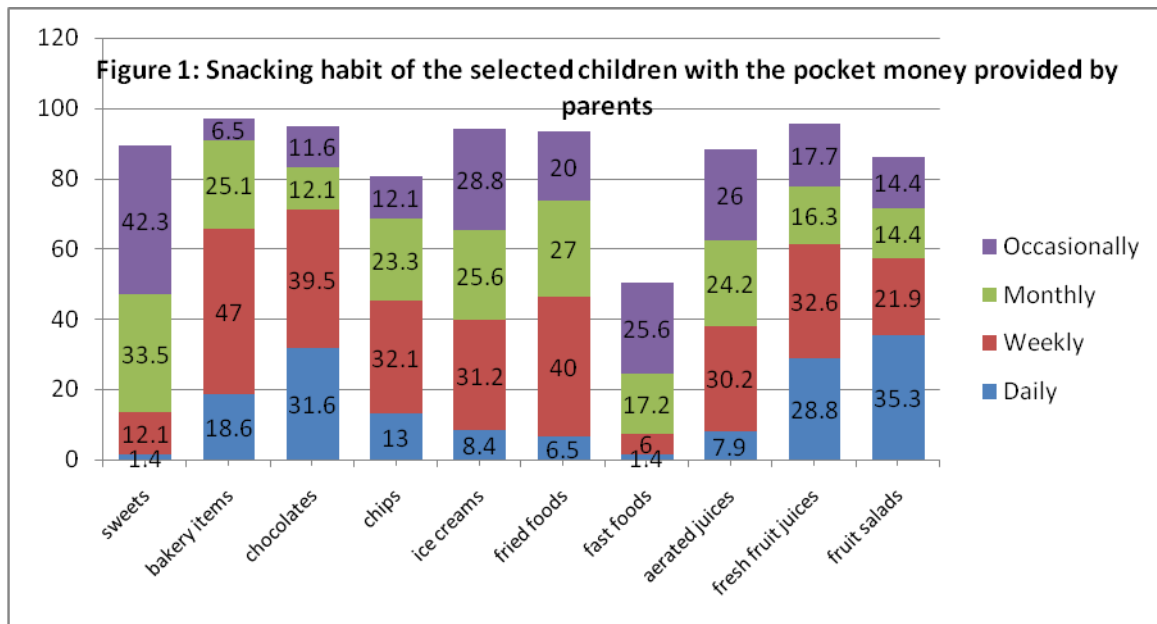
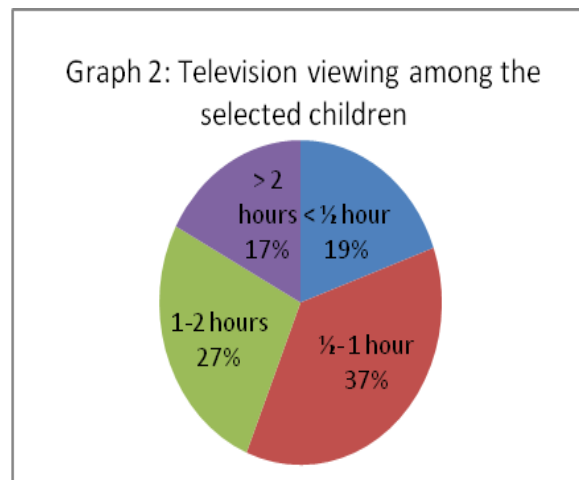


Table 2: Pearson chi- square test for pocket money and habit of dining outside

| Dining outside                   | Chi-square test |           |
|----------------------------------|-----------------|-----------|
|                                  | value           | P-value   |
| Fast food outlets-KFC, pizza hut | 26.620          | .009 (S)  |
| Restaurants                      | 11.502          | .486 (NS) |
| Road side dhabbas                | 24.384          | .018 (S)  |
| Take-away                        | 18.672          | .097 (NS) |
| Biryani shops                    | 18.271          | .108 (NS) |
| Others                           | 29.441          | .003 (S)  |

S= Significant, NS= Non significant



The Graph 2 shows the amount of time spent in front of television by the children. Twenty seven percent of children viewed television for almost 1-2 hours every day, while seventeen percent of them viewed for more than two hours. The television viewing included screen time for television,

tablets, mobile phone viewing and also computers.

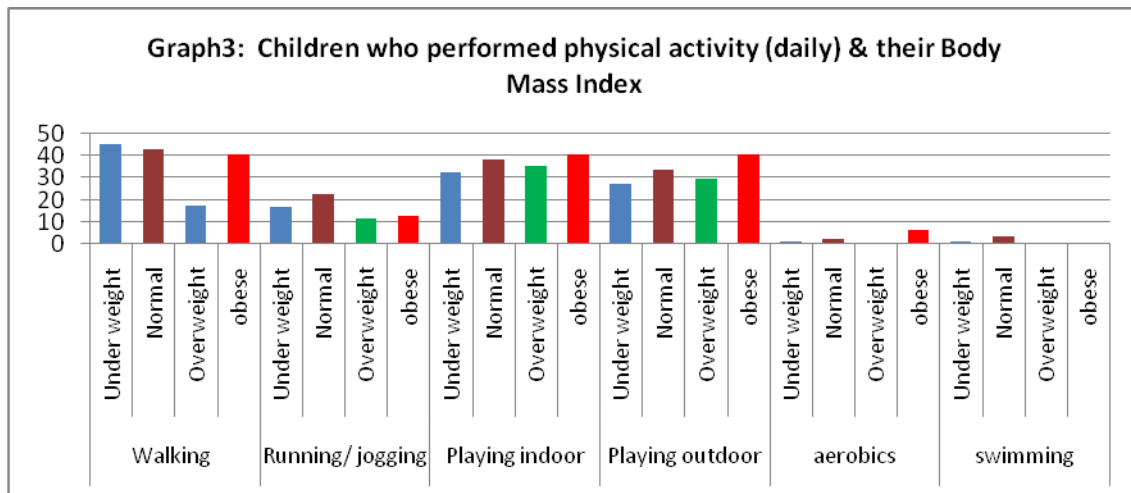
The Table 3 shows the sacking habit of the children while watching television.

Table 3: TV viewing time and snacking habit

|                | value  | P-value |
|----------------|--------|---------|
| Sweets         | 13.387 | .572    |
| Bakery foods   | 21.842 | .039    |
| Chocolates     | 11.407 | .723    |
| Chips          | 25.706 | .041    |
| Ice creams     | 17.803 | .273    |
| Fried foods    | 16.558 | .346    |
| Aerated drinks | 30.025 | .012    |

The children who performed physical activity everyday were very less as shown in the Graph 3. The results of the study done by Shankar R & Komala [12] has also proved that body weight of the teenagers significantly correlates with television viewing time and time spent on physical activities. [12]

When compared with Body Mass Index and physical activity of the children, it was observed that children who were obese exerted some form of physical activity such as walking and playing (both indoor and outdoor). Pearson's correlation between Body Mass Index and Waist Circumference showed that it was significant at 0.01 level (2- tailed).



## DISCUSSION

The study was aimed to study the prevalence and effect of lifestyle factors on childhood obesity. The socio-demographic profile of the selected subjects revealed that approximately forty percent were boys and the remaining were girls in the age group of 10-17 years. The prevalence of overweight/obesity was found to be comparatively higher among girls.

It was observed that 84.7 percent of the selected children were non-vegetarian, and only 12.1 percent were vegetarian and the remaining 3.3 percent were ova-vegetarian. Among them, 17.7 percent of children were yo-yo eaters- sometimes very healthy and other times very unhealthy, 8.4 percent ate more food, when they felt bad, bored or stressed, 11.2 percent tried new foods by seeing the advertisements, 3.7 percent had the habit of visiting restaurants/fastfood outlets with friends, 5.6 percent went in for super-sized portions, 15.8 percent craved for sweets and chocolates, 42.8 percent ate foods even if they were not hungry, and 26.5 percent ate foods which they liked even if they were unhealthy. It was also inferred that some of the parents (11.2%) rewarded their children with food for doing good. And 9.8 percent reported of eating food hiding food from their mothers.

51.2 percent of children were provided with less than Rs.25, while 39.1%, 7% and 2.8% were provided with Rs.25-50, Rs.50-100 and more than Rs.100 respectively. The children preferred to buy

bakery items (18.6%) such as cakes and puffs, chocolates (31.6%), chips (13%), ice-creams (8.4%), aerated drinks (7.9%) and fried foods (6.5%) such as pakoda, vada, etc on a daily basis. It was also reported that 35.3 percent preferred cut fruits for snacks.

There was also significant relationship between TV viewing and snacking habits of children on sweets (45.8%), bakery items (35%), chocolates (45.8%), chips such as lays (25%), ice-cream (45.8%) and fried foods (45.8%).

With respect to physical activity, it was observed that only 40.9 percent of children walked daily, especially to school. Among them 17.6 percent were obese and 40.9 percent were overweight. 18 percent have reported of running/ doing jogging everyday (11.8% overweight & 12.5% obese). Only 36.3 percent played indoors (35.3% overweight & 40.6% obese), 32.1 percent played outdoors (29.4% overweight & 40.6% obese), 13.5 percent went for dancing, 2.3 percent went for aerobics (6.3% obese), and 1.9 percent went for swimming classes daily.

## CONCLUSION

The low levels of physical activity, consumption of junk foods and snacking habits among children are associated with a higher prevalence of overweight/ obesity. Hence, overweight and obesity among children and adolescents needs a multifaceted approach such as changes in dietary pattern, enhancement of physical



activity and prevention of sedentary activities. These requires a change in thoughts of the policy makers to reframe the laws and legislations, establishing a model to be adhered by the community at large, creating awareness and empowering the children with good practices through schools and colleges and also creating awareness at individual and family level through media. Such multidisciplinary actions will help to bring about a drastic reduction in life-style disorders on the future generations.

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