Prevalence of Obesity among School Going Children Attending Paediatrics Outpatient Department of a Private Medical College Hospital at Puducherry

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ABSTRACT

BACKGROUND
Obesity is one of the most widespread and major problem affecting children in developed as well as developing countries. The prevalence of obesity has doubled in children in the last two decades. Childhood obesity is an important indicator to predict adulthood obesity and its complications. Obesity and overweight in children can lead to complications like hypertension, dyslipidaemia, hypercholesterolemia, diabetes mellitus and coronary artery disease in their adulthood and an increased risk of early morbidity and mortality. We wanted to determine the prevalence of obesity among school going children aged between 6 to 12 years attending the Paediatric OPD and to analyse the factors causing obesity in them.

METHODS
It was a cross sectional study. The sample size was 3081 children, attending Paediatric Outpatient Department of Sri Lakshmi Narayana Institute of Medical Sciences Hospital at Puducherry from July 2018 to December 2018. Data was collected on age, sex, and socioeconomic status, intake of junk foods, physical activity and parental obesity.

RESULTS
In our study, prevalence of obesity was more in lower middle class of modified Kuppuswamy scale. We found that there was a significant association between obesity and sedentary lifestyle with a significant p value of 0.015. There was also a significant association between junk food and obesity with significant p value of 0.0001. In our study, children who consumed junk foods for more than 4 days a week had greater chances of being obese. There was a significant association between parental obesity and their children being obese.

CONCLUSIONS
There is a higher prevalence of obesity in children due to lack of physical activity and junk food intake. Hence obesity prevention awareness program should be conducted in schools and lifestyle modification should be reinforced in school going children in order to prevent adulthood obesity complications.

KEY WORDS
Obesity, Socioeconomic Status, Junk Food, Physical Activity

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BACKGROUND

Obesity is a condition of unusual and excessive fat accumulation in the adipose tissue to the extent that health may be impaired (World health organization [WHO], 1997). Low level of physical activity, watching TV, and consuming junk/fast foods are associated with a higher prevalence of overweight and obesity. Childhood obesity has reached epidemic levels in developed as well as in developing countries. Obesity has a significant impact on both physical and psychological health.

The highest prevalence rates of childhood obesity have been observed in developed countries; however its prevalence is increasing in developing countries as well. Many factors including genetics, hormonal influence, inutero environment, metabolic status, nutrition status of parents, sleep pattern and eating habits are believed to play role in the development of obesity. Increase in the prevalence of childhood obesity is associated with increased potential medical complications especially in their adulthood, like hypertension, coronary artery disease, cerebrovascular accidents, Type 2 Diabetes mellitus, dyslipidaemia, gall stones, premature joint destruction and many others. Obesity in childhood and adolescence has been related to an increase in mortality in adulthood on follow up. Hoffman et al observed almost twice the risk of death in adolescents (>18 years old) with BMI > 25 Kg/m² [Comparison with subjects with BMI <25 Kg/m²] during 20 year follow up. World health organisation has declared obesity as one of the most neglected diseases of significant public health importance.

The 2002 World health report had documented overweight as the fifth most serious risk factor for both developed as well as developing countries. Evaluation of obesity in childhood is very important because it helps in preventing progression of disease with its associated morbidities in adulthood. The health and dietary behaviours of the children are highly influenced by their parent’s level of education and their weight status. Obese parents have a higher risk of having obese children as they provide both genetic and eating environment and the interaction of these influences in the familial patterns of adiposity. Sedentary behaviour characterised by wakeful activities that require little energy expenditure and during prolonged sitting or reclined position along with lack of physical activity is known to influence obesity, poor metabolic and poor psychosocial health. Diet and unhealthy lifestyles are major contributors to obesity. Obesity has become a public health concern due to its complications. This study was conducted in the age group between 6 to 12 years, attending Paediatric outpatient Department of Sri Lakshmi Narayana Institute of Medical Sciences hospital, Puducherry to determine the prevalence of obesity and their association with risk factors like socioeconomic status, intake of junk foods, physical activity and parental obesity.

METHODS

The study was a cross sectional study done at Sri Lakshmi Narayana Institute of medical sciences hospital, Puducherry.

The participants for the study were children aged between 6 to 12 years attending Paediatric outpatient Department. This study was conducted for a period from July 2018 to December 2018. The study protocol and procedures were approved by the Research Ethics Committee of Sri Lakshmi Narayana Institute of Medical sciences hospital, Osudu, Puducherry affiliated to Bharath University. After obtaining informed consent from the parents of the children and assuring full confidentiality to the participants, data was collected.

Inclusion Criteria
Children both boys and girls, aged 6 to 12 years attending Paediatric outpatient Department of Sri Lakshmi Narayana Institute of Medical Sciences Hospital were included in the study.

Exclusion Criteria
Children with chronic major illness as well as those on corticosteroid therapy, children with severe acute malnutrition, failure to thrive, underweight and children whose parents refused to give consent were excluded from the study.

Data Collection
The participants were about 3081 children. Informed written consent was obtained from the parents of the children. Data was collected on age, sex, and socioeconomic status, intake of junk foods, physical activity and parental obesity. A questionnaire regarding age, gender, socioeconomic status, parents’ profession, intake of junk foods, physical activity, parents BMI was distributed, and information was obtained.

Socioeconomic status was assessed by Modified Kuppuswamy classification. Physical parameters such as height, weight and waist/hip ratio were measured using standard procedure and BMI was calculated. Height was measured barefoot, to the nearest of 0.1 cm using a standard calibrated bar. Weight was measured without any footwear with minimal clothing to the nearest of 0.1 kg using a standard portable weighing machine and weight was recorded in kilograms. IAP BMI charts were used for calculating BMI. After calculating the BMI, the values are plotted on the IAP gender specific percentile chart 2015 and BMI status of the children was assessed.

Socioeconomic status assessed by Modified Kuppuswamy classification is as follows:

| Sl. No. | Occupation of the Head of the Family                      | Score |
|--------|-----------------------------------------------------------|-------|
| 1      | Legislators, senior officials & managers                 | 10    |
| 2      | Professionals                                             | 9     |
| 3      | Technicians and associate professionals                  | 8     |
| 4      | Clerks                                                    | 7     |
| 5      | Skilled workers and shop & market sales workers          | 6     |
| 6      | Skilled agricultural & fishery workers                   | 5     |
| 7      | Craft & related trade workers                            | 4     |
| 8      | Plant & machine operators and assemblers                 | 3     |
| 9      | Elementary occupation                                    | 2     |
| 10     | Unemployed                                                | 1     |

Occupation of the Head of the Family
In our study, Prevalence of obesity is more with lower middle class of modified Kuppuswamy scale in comparison to the study done by Mandal A et al,18 Cherian AT et al.19 Our study results were in contrast with the studies done by Goyal et al20 from Gujarat, that the prevalence of obesity is higher in upper socioeconomic status group as compared to middle socioeconomic status group.

There was a significant increase in prevalence of obesity among children with less physical activity than the children with more physical activity in our study, which is supported by studies done by Ann Smith et al21 in Texas and Aggarwa et al22 proving the relationship between sedentary lifestyle and obesity. Similar results of high risk of being obese among children lacking physical activities were reported in studies done by Kumar et al,23 Kotian et al24 and Rajaat Vohra et al.25

In our study, there was a significant association between junk food intake and obesity. Children, who consumed junk foods greater than 4 days a week, had greater chance of obesity than children who consumed junk foods less than 4 days a week. Our results were correlated well with the previous reports that junk food intake tends to be more common among overweight and obese adolescents than normal weight adolescents done by Klesges et al.26 Wolfe et al.27 Guven et al28 Jeffery et al.29

There was also a significant association between parental obesity and their children being obese. Our results are supported with the previous study which suggested that family history of obesity have more prevalence to obesity than family history of Diabetes done by King et al.30

CONCLUSIONS

In our study, we found that the prevalence of obesity among children in the age group of 6 to 12 years is relatively high due to sedentary lifestyle, intake of junk foods and parental obesity. Since obesity is now becoming a very important non-communicable disease which leads to higher morbidity, steps should be taken to prevent the disease by creating awareness about the disease both in children as well as in their parents. The CATCH study (Child and Adolescent Trial for Cardiovascular Health) in multicultural American school children and ‘Go Girls’ community based study in African American girls, showed that children can be taught to eat less fat and exercise more.31,32 WHO recommends at least 30 minutes of cumulative moderate exercise (equivalent to walking briskly) for all ages; plus for children, an additional 20 minutes of vigorous exercise (equivalent to running), three times a week.33 These recommendations are basically for prevention of obesity and its co-morbidities. Hence, obesity prevention awareness program should be conducted in schools and lifestyle modification should be reinforced in

RESULTS

A total of 3081 children were studied, out of which 93 boys and 87 girls were found to be obese. In our study, prevalence of obesity is more with lower middle class of modified Kuppuswamy scale with a significant p value of 0.005 (Table 1). There was a significant prevalence of obesity with less physical activity with significant p value of 0.015 (Table 2). Our study also shows that prevalence of obesity is more in children, who consumed junk foods more than 4 days a week with a significant p value 0.0001 (Table 3). There is also a significant increase in prevalence of obesity in children of obese parents than non-obese parents with p value of 0.0001 (Table 4).

**Table 1. Relationship Between Obesity in Children and Socio-Economic Status of Family Based on Modified Kuppuswamy Scale**

| Sl. No. | Education of Head of the Family | Score |
|--------|---------------------------------|-------|
| 1      | Prof. or honours                | 2     |
| 2      | Graduates                       | 6     |
| 3      | Intermediate or diploma         | 5     |
| 4      | High school certificate         | 4     |
| 5      | Middle school certificate       | 3     |
| 6      | Primary school certificate      | 2     |
| 7      | Illiterate                      | 1     |

**Table 2. Association between Physical Activity and Obesity (n=3081)**

| Sl. No. | Updated Monthly Family Income in Rupees (2019) | Score |
|--------|-------------------------------------------------|-------|
| 1      | ≤70,000                                          | 12    |
| 2      | 39,033-70,062                                   | 10    |
| 3      | 29,200-39,032                                   | 6     |
| 4      | 19,516-29,200                                   | 4     |
| 5      | 11,708-19,515                                   | 2     |
| 6      | 7680-11,708                                     | 2     |
| 7      | ≤3907                                           | 1     |

**Table 3. Association of Intake of Junk Food with BMI**

| Intake of Junk Food (No. of Days/Week) | BMI Category | Total | p     |
|---------------------------------------|--------------|-------|-------|
| Overweight                            | 652(50%)     | 652(50%) | 1304 | 0.0001|
| Normal                                | 44(3.9%)      | 44(3.9%) | 1777 |       |

**Table 4. Relationship between Parental Obesity and Child Obesity (N=3081)**

| Sl. No. | Score | Socioeconomic Status |
|--------|-------|----------------------|
| 1      | 26-29 | UPPER(1)             |
| 2      | 16-25 | UPPER MIDDLE (2)     |
| 3      | 11-15 | LOWER MIDDLE (3)     |
| 4      | 6-10  | UPPER LOWER (4)      |
| 5      | <5    | LOWER(5)             |

**Table 1. Relationship Between Obesity in Children and Socio-Economic Status of Family Based on Modified Kuppuswamy Scale 2019**

| Physical Activity for Number of Days Per Week | Obese/ Overweight | Normal/ Underweight | p     |
|----------------------------------------------|-------------------|--------------------|-------|
| >4 days                                      | 54(30%)           | 164(54.9%)         | 0.015 |
| ≤4 days                                      | 120(70%)          | 133(45.1%)         |       |
children as well as in their parents in order to prevent complications of obesity like type II diabetes, hypertension and cardiovascular diseases. It is important to teach the children to follow healthy eating habits and educate them about the importance of physical exercise since childhood.

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