Overweight and obesity among school-going children of Lucknow city

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ABSTRACT

Background: Childhood obesity is increasingly being observed with changing lifestyles of families. The magnitude of overweight ranges from 9% to 27.5% and obesity ranges from 1% to 12.9% among Indian children. Objectives: The present study was undertaken to study the magnitude of overweight/obesity and its determinants among children in Lucknow city. Materials and Methods: A list of government and private school was procured from Office of Basic Shiksha Adhikari. Three government and three private schools were selected by Simple Random Sampling. Students of 5th to 12th grades available at the time of study were included as study unit. Predesigned and pretested questionnaire was used to elicit the information on family characteristics and individual characteristics. Height and weight were measured and BMI was calculated. Children with BMI of 25 and above were considered overweight and children with BMI more than 30 were considered obese. Results: Overweight and obesity was found to be 4.17% and 0.73%, respectively; they together constitute 4.91% for overweight/obesity. The study revealed that the important correlates of overweight/obesity were father’s education, father’s occupation, class, children playing outdoor games for less than 30 min, and those consuming fast foods. Conclusions: Children of higher classes (above 8th standard) belonging to higher socioeconomic group with less outdoor activities and consuming fast foods were more predisposed to overweight/obesity. As a preventive strategy, there is a need to apply health and nutritional education programs for inculcating healthy life styles, and incorporating more outdoor activities in Physical Education Department of school curriculum.

Key words: BMI, overweight, obesity, school-going children

INTRODUCTION

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. The World Health Organization has described obesity as one of today’s most neglected public health problems. Following the increase in adult obesity, the proportion of children and adolescents who are overweight and obese have also been increasing. The magnitude of overweight ranges from 9% to 27.5% and obesity ranges from 1% to 12.9% among Indian children.

The most important consequence of childhood obesity is its persistence into adulthood with all its health risks. The health risks include cardiovascular diseases, diabetes, osteoarthritis, gallbladder disease, and some sex hormone sensitive cancers. It is more likely to persist when its onset is in late childhood or adolescence.

Although several studies have been conducted in metropolitan cities in India on overweight and obesity among children, a very few studies have been conducted in Lucknow. The present study was undertaken to study the magnitude of overweight/obesity and its determinants among school-going children in Lucknow city.

MATERIALS AND METHODS

Firstly, we went to the office of basic Shiksha Adhikari...
and procured the list of government and private schools in Lucknow district. Then, we selected three government and three private schools by simple random sampling. Students of class 5th to 12th were selected as study unit. Probability proportionate to size of the population (PPS) technique was used to select the number of children from each class and section. The required number of children from each section was selected by systematic random sampling. The study population includes 407 students of class 5th to 12th of coeducational school from both government and private sector. The schools are located in different areas of Lucknow, where students of different socioeconomic status study. Before undertaking this study, due approval was taken from institutional (Era’s Lucknow Medical College and Hospital) ethical committee.

A predesigned and pretested questionnaire was used to interview the study participants to elicit the information on family characteristics like residence, type of school, religion, type of family, education and occupation of parents. Information on individual characteristics like age, sex, eating habits, and time spent on television viewing and outdoor games were also collected. In our study, we took fast food consumption “yes” if the child was taking fast food more than three times a week. Similarly regular outdoor and indoor playing routinely >30 min/day was considered “yes.” Child was interviewed about the father’s occupation in the presence of school teacher. Help of school teacher was also taken if the child had any problem in explaining father’s occupation. During data collection, school authorities were asked to accompany us to the respective classes.

Body weight was measured (to the nearest 0.5 kg) with the subject standing motionless on the weighing scale with feet 15 cm apart, and weight equally distributed on each leg. Height was measured (to the nearest 0.5 cm) with the subject standing in an erect position against a vertical scale and with the head positioned so that the top of the external auditory meatus was in level with the inferior margin of the bony orbit.

Body mass index (BMI) was calculated as weight in kilograms/height in meter$^2$. Overweight and obesity was assessed by BMI for age.$^{[11]}$ Children with BMI of 25 and above were considered overweight and children with BMI more than 30 were considered obese. Data were analyzed using SPSS version 11.5.

**RESULTS**

A total of 407 children of 5th to 12th standard participated in the study. Of them, only 141 (34.64%) were normal, 246 (60.44%) were undernourished, 17 (4.17%) were overweight, and 3 (0.73%) were obese.

On applying odds ratio, risk of overweight/obesity was significantly higher in children who played outdoor games for <30 min (OR13.97, 95% CI=1.96–2.83) and those who consumed fast foods (OR 9.17, 95% CI=1.28–1.86). Other factors like mother’s education, mother’s occupation, religion, residence, type of school, type of family, and type of food were not found to be statistically significant [Tables 1 and 2].

Table 3 shows that father’s education, father’s occupation,

| Characteristics | Total (N=407) | Overweight/obese n (%) | OR (CI)     | P value |
|-----------------|--------------|------------------------|-------------|---------|
| Mother's education |              |                        |             |         |
| <6th standard   | 121          | 4 (3.30)               | 0.58 (0.16–1.89) | 0.46    |
| ≥6th standard   | 286          | 16 (5.59)              |             |         |
| Mother's occupation |          |                        |             |         |
| Unemployed      | 373          | 17 (4.55)              | 0.49 (0.13–2.25) | 0.49    |
| Employed        | 34           | 3 (8.82)               |             |         |
| Residence       |              |                        |             |         |
| Rural           | 133          | 6 (4.51)               | 0.88 (0.29–2.51) | 0.79    |
| Urban           | 274          | 14 (5.10)              |             |         |
| Religion        |              |                        |             |         |
| Hindu           | 340          | 16 (4.70)              | 0.77 (0.23–2.81) | 0.87    |
| Other           | 66           | 4 (6.06)               |             |         |
| Type of school  |              |                        |             |         |
| Hindi medium    | 307          | 16 (5.21)              | 1.32 (0.40–4.79) | 0.82    |
| English medium  | 100          | 4 (4.00)               |             |         |
| Type of family  |              |                        |             |         |
| Nuclear         | 207          | 6 (2.89)               | 0.40 (0.13–1.13) | 0.06    |
| Joint           | 200          | 14 (7.00)              |             |         |
and class were significantly associated with overweight and obesity among the study population by chi square test.

**DISCUSSION**

Obesity among children in India has become a public health problem (prevalence >5%). In the present study, overweight and obesity was found to be 4.17% and 0.73%, respectively, together constituting 4.91% for overweight/obesity.

Bharati et al. reported prevalence of overweight and obesity to be 3.1% and 1.2%, respectively, together constituting 4.3%.[12] Sethi and Kapoor[13] reported prevalence of obesity to be 7.8% and 13.4% from Delhi. Deshmukh et al. reported prevalence of overweight/obesity to be 2.2% in rural area of Wardha district.[14]

In the present study, the important determinants of the overweight/obesity were father’s education, father’s occupation, class >8th standard, and outdoor playing <30 min. Overweight and obesity are more prevalent in

| Table 2: Risk factors of overweight/obesity – Individual characteristics |
|-------------------------------------------------------------|
| Characteristics                | Total (N=407) | Overweight/obese n (%) | OR (CI)        | P value |
| TV viewing                     |               |                         |                |         |
| <30 min                        | 208           | 13 (6.25)                | 1.83 (0.66–5.19) | 0.20    |
| >30 min                        | 199           | 7 (3.51)                 |                |         |
| Outdoor playing                |               |                         |                |         |
| <30 min                        | 242           | 19 (7.85)                | 13.97 (1.96–2.83) | 0.002   |
| >30 min                        | 165           | 1 (0.60)                 |                |         |
| Indoor playing                 |               |                         |                |         |
| <30 min                        | 267           | 15 (5.61)                | 1.607 (0.53–5.18) | 0.5     |
| >30 min                        | 140           | 5 (3.57)                 |                |         |
| Type of food                   |               |                         |                |         |
| Vegetarian                     | 298           | 15 (5.03)                | 1.10 (0.36–3.57) | 0.85    |
| Non vegetarian                 | 109           | 5 (4.58)                 |                |         |
| Consume fast food              |               |                         |                |         |
| Yes                            | 280           | 19 (6.78)                | 9.17 (1.28–1.86) | 0.01    |
| No                             | 127           | 1 (0.78)                 |                |         |

| Table 3: Correlates of overweight/obesity |
|------------------------------------------|
| Characteristics                      | BMI category | Total | χ²(df)  | P value |
|------------------------------------------|--------------|-------|---------|         |
|                                         | <18.5        | 18.5–24.9 | >25     |         |
| Father’s education                     |              |         |         |         |
| Illiterate                              | 20           | 6      | 2       | 28      |
| Primary                                 | 28           | 15     | 1       | 44      |
| High school                             | 65           | 28     | 3       | 96      |
| Inter                                   | 60           | 20     | 2       | 82      |
| Graduate                                | 55           | 49     | 8       | 112     |
| Postgraduate                            | 18           | 23     | 4       | 45      |
| Total                                   | 246          | 141    | 20      | 407     |
| Father’s occupation                     |              |         |         |         |
| Unskilled                               | 3            | 1      | 1       | 5       |
| Semiskilled                             | 11           | 1      | 1       | 13      |
| Skilled                                 | 29           | 16     | 1       | 46      |
| Clerical, shop owner, farmer            | 108          | 56     | 5       | 169     |
| Semiprofession                          | 70           | 34     | 7       | 111     |
| Professional                            | 25           | 33     | 5       | 63      |
| Total                                   | 246          | 141    | 20      | 407     |
| Class category                          |              |         |         |         |
| ≤8th class                               | 143          | 33     | 1       | 177     |
| >8th class                               | 103          | 108    | 19      | 230     |
| Total                                   | 246          | 141    | 20      | 407     |
children of higher classes and belonging to affluent and higher socioeconomic group families.

Thus, it is recommended to start school-based programs where:

1. There should be regular class hours on healthy food habits, nutritive values of different food items, lifestyle, and behavioral modification;
2. Teachers should be motivated to explain the health-related problems through nonconventional ways like short play, video clips, games, etc.,
3. Every student should take part in outdoor games and sports, irrespective of gender, and
4. Parents should be advised about obesity problems not only for their children but also for themselves.

The findings of the study are based on interview of students of class 5th to 12th. Although the full information about the study was explained to the students, there are chances that the interpretation made by them may be different because of their age and perception. The limitation of this interview-based study is that the findings are based on recall of the interviewee.

CONCLUSIONS

Children of higher classes (above 8th standard) belonging to higher socioeconomic group with less outdoor activities and consuming fast foods were more predisposed to overweight/obesity. As a preventive strategy, there is a need to apply health and nutritional education programs for inculcating healthy lifestyles, and incorporating more outdoor activities in Physical Education Department of school curriculum.

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