Prevalence and Factors Influencing Obesity in Children Aged 6-14 Years belonging to Upper Middle Income Group of Lucknow City

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ABSTRACT

Introduction: Children are increasingly become vulnerable to overweight and obesity. High calorie food sedentary life style, physical inactivity, extra munching of calorie dense food like chips during. Obesity is indepently responsible for the occurrence of several dreadful diseases like CVD, Diabetes,orthopaedic, hepatic, pulmonary and renal disorders which increase risk for morbidity and mortality as well as reduced life expectancy. So the necessary treatment is immediately required to limit the condition at childhood stage itself which involves the multidisciplinary approach of dietary management, physical activity enhancement, restriction of sedentary behaviour and at last pharmacotherapy and bariatic surgery if condition is inevitable. The study was done to determine prevalence of overweight and obesity among school going children aged 6 to 14 years belonging to upper middle income group of Lucknow city and to identify factors influencing overweight and obesity.

Material and methods: A cross sectional study was conducted. 1862 school children studying in 1st to 9th standard were studied. Socio demographic,anthropometric, dietary data and physical activity was collected using pre-tested questionnaire.

Results: The prevalence of overweight and obesity was 6.19% and 5.10% respectively. Frequent Consumption of soft drinks and food outside home, less physical activity time and watching TV more than 1.5 hrs /day were the significant factors for overweight and obesity.

Conclusion: Increased soft drink consumption and food intake outside home should be avoided by children. Physical activity duration must be increased. Health education to teachers, parents and students will help to reduce the prevalence of obesity.

Keywords: Childhood obesity, BMI, Epidemiology, Lucknow.

INTRODUCTION

The prevalence of Obesity is increasing at alarming stage. Childhood obesity has more than tripled in past 30 years. The prevalence of obesity among children aged 6 to 11 years has increased from 6.5% in 1980 to 19.6% in 2008. The prevalence of obesity among adolescents aged 12 to 19 years has increased from 5.0% to 18.1%.[1] According to the National Health and Nutrition Examination Survey (NHANES), approximately 17%of children anmd adolescents aged 2 to 19 years are obese and they will likely to become obeser adults.[2] A another study by Park K et al (2005) revealed that 80%of overweight children were obese adults when they turn 25.[3] Childhood obesity can profoundly affect children's physical health, social, and emotional well-being, and self esteem. It is also associated with poor academic performance and at times may lead to mental illness. 50-80% of obese children will continue as obese adults.[4] Due to difficulty in treatment

of obesity in adults and many long term side effects of childhood obesity, prevention of childhood obesity has now been recognized as a public health priority. With this background in mind, the present study was undertaken to know the prevalence of overweight and obesity and factors influencing it in children of upper middle income group aged 6 to 14 years studying in 1st to 9th standard in private schools of Lucknow city.

Aims and objectives of the research were to determine the prevalence of overweight and obesity among children belonging to upper middle income group of aged 6-14 years studying in class 1st to 9th in private schools of lucknow and to determine factors contributing to overweight and obesity among the subjects in the study.

MATERIAL AND METHODS

The present cross – sectional study was conducted among school going children of Lucknow city in academic session 2013-2014. Overall 1826 students(988 boys and 838 girls) of lucknow city aged 6 to 14 years enrolled in class 1st to 9th were interviewed and examined Urban Lucknow is divided into six zones. These six zones were further sub divided into Cis Gomti and Trans Gomti From Cis Gomti two zones were randomly selected and similarly two zones from Trans Gomti were randomly selected. Further from each zone 2 senior secondary schools were randomly selected from school list provided by DIOS Lucknow So total 4 schools were selected for the study All the students were invited to participate in study. Questionnaire were distributed to all students willing to participate It is advised to fill the Questionnaire by parents to the students upto class 5th To determine the minimum required sample size has been calculated using the formula: $N=p(1-p)/d^2$ were used. (BlandM: Oxford University press)[5] Where P for prevalence of childhood obesity from the previous study in Lucknow i.e., 290 (29%) (NDOC 2015)[6] and d= allowable error of known prevalence ie. d=0.01. Ideally it should be 0.05, but to be on safe estimation with minimum sample size we allowed only 1% (0.01) ceros of prevalence the overall prevalence of child obesity is 29%. Thus, the sample size n=2059 but a total of 1826 subjected partic-

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Age (Yrs)	Boys				Girls			
	n	Non-Obese	Obese	Prevalence percentage	n	Non-Obese	Obese	Prevalence Percentage
6	45	34	11	24.44	38	27	11	28.94
7	56	49	9	16.07	51	44	7	13.72
8	102	95	7	6.86	81	74	7	8.64
9	110	99	11	10.0	97	90	7	7.21
10	125	114	11	8.80	85	77	8	9.41
11	140	130	10	7.14	112	100	12	10.71
12	94	79	15	15.95	90	76	14	15.55
13	146	133	13	8.90	134	117	17	12.68
14	170	152	18	10.58	150	132	17	11.33
Total	988	883	105	10.62	838	737	101	12.05
Table-1: Provide table legend								

Characteristics	Normal	Overweight and obese
Age (6-14 Years)		
Eating Snacks in between Meals		
Yes (%)	90.26	9.74
No (%)	78.87	21.13
Soft drink consumption/week		
Take more than Once (%)	53.33	46.67
Take Once or No (%)	91.04	9.96
Food outside/Week		
Take more than once	89.28	11.72
Take Once or No(%)	91.11	8.89
Physical Exercise		
Yes (%)	91.06	8.94
No (%)	85.68	14.32
Television Watching		
More than 1.5 hr	66.90	33.10
Less than 1.5 hr	66.74	7.26

Table-2: Characteristics of Normal and overweight /obese subjects in years 6 -14.

ipated in the study. Following a random sampling procedure 2000 individuals aged 6 to 14 years were identified to participate in the study. Among them, 1826 subject agreed to participate. The purpose of the study was explained and oral consent was obtained from the participants before enrolling them in the study. A pretested semi-structured questionnaire was used to elicit the information of family and individual characteristics. The questionnaire had 4 sections:

Section-A : General Information
Section-B : Physical Activity
Section-C : Dietary History
Section-D : Examination

Clinical Examination and anthropometric measurements of height and weight were taken using standard equipments (Stadiometer/Measuring scale and bathroom scale weighing machine) to calculate Body mass Index (BMI). All the instruments used for study were calibrated daily. The data was recorded in the questionnaire under the section 'D' 'Examination' Two Visits were made to each school to ensure complete coverage.

STATISTICAL ANALYSIS

Data was entered into Microsoft excel sheet and analysis using SPSS/Epi info software. Descriptive statistics like frequency, percentages, measures of central tendency, measures of dispersion and inferential statistical test like Chi-square test, t-test, Spearman correlation cofficient were used. The statistical significance was evaluated at 95% confidence level ($P < 0.05$).

RESULTS

A total of 1826 (988 boys and 838 girls) school children were included in the study. Utilizing International cut off points for BMI for overweight and obesity by sex between 2-18 years,defined to pass through BMI of 25 and 30kg/m^2 at age of 18th.[7] A total of 206 subjects (105 boys and 101 girls)were found to be overweight and obese. The overall prevalence of overweight and obesity was found to be 11.29%. Highest prevalence of overweight and obesity were highest in 14 years age students followed by 13 and 11 years of age There was no significant association between sex and prevalence of overweight and obesity. (Table: 1)

Obese and overweight children take snacks more often in between meals than normal children. Similarly overweight and obese children participate in physical exercise less often than normal children. The results showed more physical exercise did influence change in BMI. Frequently having food outside home and frequent consumption of soft drinks have more prevalence of obesity and overweight than normal weight counterparts indicates that caloric intake is associated with increase in BMI. Television watching hours also have somewhat association with increase in BMI (Table: 2)

DISCUSSION

In a study done by Flegal KM et al (1999-2000) about 10% of school children aged between 5 to 17 years around the world are overweigh out of which 70% grow as to become obese adults.[8] In another study conducted by Lazarus et al. (1996) about 42 million of school children aged less than 5 years are overweight, and of these 35 million are residing in developing countriesand girls are proportionately more overweight than boys in both developed and developing countries.[9] In Metropolitan city Delhi Kapil U et al. (2002) found prevalence of obesity of 7.4% while Sharma et al (2005) found 22% overweight and 6% obese students.[10,11]

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The present study showed the prevalence of overweight and obesity 6.19% and 5.10% respectively. In boys 5.97% were overweight and 4.66% were obese while in girls 6.44% were overweight and 5.60% were obese. Our result are consistent with previous studies done by Chattwal et al (2008)[12] and by CA Kalpana (2011)[13] in Coimbatore. Several disorders have been linked to overweight and obesity in childhood. obesity results ion considerable morbidity and mortality.

Questionnaire about number of meals in a day consumption of, soft drink and food outside home (junk foods) provide information about subsequent health outcomes as they have special role in leading obesity. In the present study frequency of eating snacks between meals, consumption of soft drinks and junk foods have positive relation with prevalence of overweight and obesity. Thus results correlates well with previous studies which suggest that junk food (food outside home) and soft drink intake tends to be more common among overweight and obese children than among normal weight children.[14] Junk food contains more amount of fat than carbohydrate and protein. Fat is less satiating than carbohydrate and dietary fat is stored more efficiently than carbohydrate or protein which finally results in obesity or overweight.[15] Similarly irregular food intake deleteriously affects nutritional health, reduces energy levels and promotes consumption of high caloric food later in a day.[16]

CONCLUSION

In all, the study demonstrated that consumption of high fat and high energy foods (junk foods) and soft drinks more than once in a week lead to the overweight and obesity. Prevention of obesity is easier in children than adults. Based on findings it is recommended to reduce the rate of consumption of soft drinks and food outside the home. Eating while watching TV should be discouraged. increased physical activity like playing outdoor games, cycling should be encouraged in children. Health Education should be given to parents, teachers and children regarding dietary habits and healthy life style. (School Based Intervention).

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