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Isobesityamongchildren Amatterof Concern? A Cross-Sectionalstudy Inaslumof Kolkata

Dhiraj Biswas[1], Aparajita Dasgupta[2], Sanjayakumar sahoo[3], P S Preeti[4]
Post Graduate Trainee,
Department Of Preventive And Social Medicine,All India Institute Of Hygiene And Public Health, (The West Bengal University Of Health Sciences), Kolkata-700073, West Bengal, India
Email Id: Drdhirajbiswas@Gmail.Com
Professor And Head Of The Department,
Department Of Preventive And Social Medicine,All India Institute Of Hygiene And Public Health, Kolkata-700073, West Bengal, India
Email Id: Draparajitadasgupta@Gmail.Com
Post Graduate Trainee,
Department Of Preventive And Social Medicine,All India Institute Of Hygiene And Public Health
Email Id: Sanju_Dr97@Yahoo.Co.In
Post Graduate Trainee,
Department Of Preventive And Social Medicine,All India Institute Of Hygiene And Public Health
Email Id:Drpreeti186@Gmail.Com

Institutional Field Area : A Slum Under Union Health Centre Of Chetla, Aiih & Ph, Kolkata.

ABSTRACT:-
BACKGROUND: Childhood obesity has become so common that days are not far off when it will replace under nutrition as a significant contributor to ill-health. 50-80% of obese children will continue with their status in adulthood, resulting in higher risk of Diabetes, Hypertension, Coronary Heart Diseases and many obesity related diseases. The present study was undertaken with the objective to find out the magnitude of obesity and its association with socio-demographic and behavioral characteristics.
METHODS: A cross sectional study was conducted on120 children (aged 6-15 years) in a slum Chetla under the purview of AIIHPH, Kolkata. BMIof the children was measured and socio-demographic characteristics and other risk factors were assessed during the study with the help of a semi structured, pretested questionnaire.
RESULTS:Theoverall prevalence of obesity was 13.3%. Prevalence among boys and girls was 48.3% and 51.7% respectively. Among the obese78.3% were takinghigh calorie food. Regarding physicalactivity 52.5% donotcycle while52.5% children were playing for less than 1 hour per day. Obesity was significantly associated with age, sex, education of mother, socioeconomic status and high calorie food. However other variables like physical activity did not show any significant association.
CONCLUSION: Greater emphasis should be laid inthe society in terms of prevention of obesity and on reinforcing all preventive measures like physical activities, correct diet, and maintenance of correct BMI. This will in the long run help in enhancement of control of many non-communicable diseases which are associated with obesity especially childhood obesity.

Key words: Childhood Obesity, Influencing Factors, Body Mass Index

Introduction:

Childhood obesity is alarmingly increasing worldwide[1] and it is linked with an increased risk of obesity in adulthood[2], morbidity, and mortality[3]. Obesity has become so common that it is beginning to replace under nutrition and infectious diseases as the most significant contributor to ill-health. 50-80% of obese children will continue as obese adults[4] and falls into risk group of Diabetes, Hypertension, Coronary Heart Diseases and many more obesity related diseases. Complications of adult obesity are made worse if the obesity begins in childhood. Obesity is harder to treat in adults than inchildren[5].

Globally the prevalence of childhood obesity varies from over 30% in USA to less than 2% in sub- Saharan Africa. Currently the prevalence of obese school children is 20% in U K and Australia, 15.8% in Saudi Arabia, 15.6% in Thailand, 10% in Japan and 7.8% in Iran[6,7]. National representative data for childhood obesity in India is unavailable, however available studies of Chennai and Delhi has shown that prevalence of 6.2% and 7.4% respectively[8,9]

India is going through a nutrition transition phase and is now facing the double burden of nutrition disorders. Poor rural and urban slum populations have a high prevalence of under nutrition and on the other side, the newly rich urban, middle, and high income populations suffer from an emerging problem of obesity due to changing lifestyles and diet[10]. Very lately the curse of overweight and obesity have encroached the urban slum too especially among the children before even under-nutrition could be controlled. As a result the slum children are overburdened with the impact of both under-nutrition and overweight.

With this background a study was proposed and executed to assess the nutritional status with special emphasis on overweight and obesity of school going children (6-15 years) among a slum population of Kolkata.

Objectives:

1. To study the socio-economic and demographic characteristics of the study population.

2. To assess the prevalence of obesity among the study population.

3. To find out association of obesity with socio-demographic and other risk factors.

Methods:

Study Settings:

The study was conducted in a slum of Chetlaof Kolkata which is the urban field practice area of All India Institute of HygieneandPublic Health,Kolkata.

Study population and study area:

School going children in age group of 6-15years.

Sample size:

It was found in a study that approximately 7.5 % of children suffering from obesity[11]Now considering this prevalence with 5% absolute allowable error sample size was calculated to be 111 after applying the formula-

Sample size= $4pq/L^2$

(p=prevalence, q=1-p and L=allowable error).

A total of 120 school going children participated in the study. They were chosen by simple random sampling from a line list of such children obtained from the official records of Urban Health Centre, Chetla. To maintain the homogeneity of the study population non-school going children were excluded from the study

Inclusion criteria:

School going children in the age group of 6-15 years whose parents (any one of them) gave consent for their participation.

Exclusion criteria:

- Children having chronic illness, severe malnutrition, endocrinal problems, physical and mental defects.
- Children aged below 6 years and above 15 years.
- Children who were not currently going to school.

Instrument and techniques

1. A predesigned and pretested schedule whose face and content validity was ensured by the experts of All India Institute of Hygiene and Public Health. All efforts were made to make the questionnaire simple, unambiguous and conformed to the objectives of the study.Since the study population was Bengali the questionnaire was prepared in the Bengali language only.
2. A properly calibrated weighing machine and measuring tape were used to measure the weight and height of each child using standard operation procedure[12]. BMI was calculated as [weight in kg/ (Height in m.)^2].

Study variables:

For Objective No:-1

1) Socio-economic factors (Education, occupation andincome).

2) Demographic factors (Agebirth certificate), gender, religion and type of the family-nuclear/joint).

For Objective No :-2

1) Anthropometric measurements.

2)Lifestyleand Behavioral factors(Playing, cycling, high calorie diet)

Definition of overweight and obesity:

Children were categorized into three groups: obese (>95th percentile), overweight (≥85th percentile) and normal (<85th percentile,> 5th percentile) using age- and sex specific percentiles of BMI.[13]

STATISTICAL ANALYSIS AND PLAN:

Data was analyzed using appropriate statistical methods by SPSS (version 20).

Ethical Issues:

This research study was cross sectional and non-interventional in nature. Verbal informed consent of parentsof the selected children under study was taken and they were also made aware about the nature and purpose of the research study. The parents were also told that all data would be kept confidential and would be used only for research and academicpurpose.At the end of the data collection the parents were given health education on the correct child feeding and rearing practices which would ensure a healthy child with normal weight.

Results:

Table 1 Total number of 120 children studied.The prevalence of obesity in this population was 13.3%. Most of the children (57.5%)) belonged to 6-10 years age group (mean=9.97years, sd=2.85) and 51.7% are female. Among the total children 85.8% belonged to SC and ST category.

Table 260% children read in class one to class four. Among the total children 63.3% belonged to lower and lower middle socio economic class as per the modified BG Prasad's socioeconomic status scale of 2013.34.4% of the mothers were illiterate. Among them 82.5% mothers were homemakers.

Table 3 52.5% children were playing less than one hour and never cycled for transport.Most of them (78.3%) were not taken high calorie food

daily. Overall boys and girls were equallydistributed in each age category(48.3% Boys and 51.7% Girls, boys: girls ratio of 1:1.06). Among them 16 children were obese (Boys-12,Girls-4). Prevalence of obesity was 13.33%.

Table 4 Prevalence of obesity was more in boys (20.7%) than girls (6.5%) and this difference was significant. Surprisingly the prevalence of obesity decreased with increase in age.

Prevalence of obesity was significantly decreasing with increase in the children's education, but obesity increased with decrease in mother's education.Prevalence of obesity was significantly more among those belonging to higher socioeconomic status (25%) than lower SES (6.6%).

An attempt was made to elicit some explanatory factors of childhood obesity like habit of snacking of high-energy foods(i.e 30.8% obesity among those who were snacking daily and 8.6% among those who were not snacking daily.) and lack of physical activity (19% obesity among those played for more than 1 hour and only 7% among those who played for less than 1 hour.

Table-1:Distribution of school going children according to demographic pattern (n=120)

Variable	Frequency	%
AGE		
6-10yrs	69	57.5
11-15 yrs	51	42.5
SEX		
Male	58	48.3
Female	62	51.7
CASTE		
SC and ST	103	85.8
OBC and General	17	14.2
BMI		
Obese	16	13.3
Non obese	104	86.7

Table-2:Distribution of school going children according to socio-economic status (n=120)

Variable	Frequency	%
EDUCATION		
Class 1-4	72	60
Above Class-4	48	40
MOTHER'S EDUCATION		

Illiterate	41	34.2
Literate	79	65.8
MOTHER'S OCCUPATION		
HOUSEWIFE	99	82.5
OTHERS WORKERS	21	17.5
PCI		
Social class 2and3	44	36.7
Social class 4and5	76	63.3

Table-3 :Distribution of school going children according to physical activity(n=120)

Variable	Frequency	%
PLAYING		
<= 1 hr	63	52.5
>1 hr	57	47.5
CYCLING		
Yes	57	47.5
No	63	52.5
HIGH CALORIE FOOD INTAKE		
Daily	26	21.7
Not daily	94	78.3

Table-4 :Association of obesity with Socio-demographic, and other relevant variables (social class, playing, cycling and high calorie food)*bivariate and Multivariate Logistic Regression* (n=120).

Co-Variates	No Obese n(%)	Obese n(%)	OR (CI)	AOR (CI)

Age Group Mean=9.97, sd=2.85	6-10 yrs	54 (78.3)	15 (21.7)	13.88(1.76-109.02)	16.75 **(2.02-137.05)
	11-15 yrs	50 (98)	1 (2)	1	1
Sex	Male	46 (79.3)	12(20.7)	3.78 (1.14-12.50)	4.67 **(1.34-16.30)
	Female	58 (93.5)	4 (6.5)	1	1
Caste	ST And SC	89 (86.4)	14 (13.6)	1.18 (0.24-5.72)	0.85 (0.15-4.84)
	OBC & Others	15 (88.2)	2 (11.8)	1	1
Educational Status	Class1-4	57(79.2)	15 (20.8)	12.36(1.57-97.11)	13.57 **(1.67-110.19)
	> Class-4	47 (97.9)	1 (2.1)	1	1
Mother's Education	Illiterate	34 (82.9)	7 (17.1)	1.60 (0.55-4.66)	0.40 (0.12-1.32)
	Literate	70 (88.6)	9(11.4)	1	1
Mother's Occupation	Housewife	84 (84.8)	15 (15.2)	3.57(0.44-28.64)	0.27 (0.03-2.45)
	Other Workers	20 (95.2)	1 (4.8)	1	1
Social Class(PCI) [According to Modified B GPrasad]	Social Class (II)and(III)	33 (75)	11 (25)	4.73 (1.52-14.72)	1.16(0.36-3.66)
	Social Class (IV)and(V)	71 (93.4)	5 (6.6)	1	1
Playing	< 1 Hr	51 (81)	12 (19)	3.11 (0.94-10.30)	0.44 (0.87-9.64)
	>=1 Hrs	53 (93)	4 (7)	1	1
Cycling	No Cycling	53 (84.1)	10 (15.9)	1.60 (0.54-4.73)	0.99 (0.26-3.68)
	Cycling	51(89.5)	6 (10.5)	1	1
High Calorie Food	Daily	18 (69.2)	8 (30.8)	4.77(1.58-14.40)	0.28 **(0.085-.95)
	Not Daily	86 (91.5)	8 (8.5)	**1**	**1**

** Significant variables in multivariate analysis.

Discussion:

The prevalence of obesity (13.33%) among School children observed in this study has almost similar to the studies by Al-Nuaim et al[6] and Mo-Suwan et al[7] in which prevalence of obesity were 15.8% and 15.6% respectively. Another study byRamachandran,*et al*[14]the prevalence of overweight (including obese) adolescents ranged from 22% in better off schools to 4.5% in lower income group schools. Preetam B Mahajan et al[15], , S Kumar et al[16]and Beena Dave et al[17] in their studies found the prevalence of obesity among the children were (4.69%) ,5.74% and 8.94% respectively which is lower than that found in the current study i.e 13.33%. Current study found that the prevalence of obesity was higher among boys (20.7%) than girls (6.5%) which is littlehigher than the studies by Mo-Suwan et al[7] in which prevalence of obesity among boys were 4.42% and girls 8.82% and by Preetam B Mahajan et al[18] where prevalence among boys were 8.60% and girls 9.18% .This trend may be explained by the fact that all parents of this country have a propensity to be over indulgent and over protective with their male child in relation to the female child. In current study prevalence of obesity was more among the higherthan the lower socioeconomic class (25%

vs6.6%).Similar finding (22% vs 4.5%) was observed in the study by Ramachandran,*et al*[17]. In this study snacking of high calorie foods and lack of physical activity were the important influencing factors for obesity, which is similar to the observation of SheetalMonga study[18].The present study highlights the fact that childhood obesity is an emerging health problem even in the slum areas. Therefore, effective preventive strategies should be developed to halt this epidemic at its beginning since it has been projected that 50-80% of obese children will become obese adults and complication of adult's obesity is worse if the obesity begins in childhood[19]. Prevention of obesity in children is easier than the adults. Based on the findings of this study it is recommended that consumption of high fat and high calorie (Junk foods) and snacking in between the meals should be avoided by children. Sedentary life style should be discouraged. Increase physical activity like playing out door games, walking; cycling should be encouraged in children. Health education should be given to parents, teachers and children regarding dietary habit and sedentary life style.

Recommendation : Scope of Health Education

Promoting a healthy diet

a) Promote and support exclusive breastfeeding: for the first six months of life, continued breastfeeding until two years old and beyond and adequate and timely complementary feeding.

b) Develop policy measures directed at food retailers to improve the accessibility and affordability of healthier food products (fruit and vegetables, products).

c) Ensure the provision of healthy food in all public institutions, school and in workplaces

d) Conduct public campaigns and social marketing initiatives to inform mothers about healthy dietary patterns and to facilitate healthy behaviors.

e) Create health and nutrition promoting environment in schools, work sites, clinics and hospitals, including nutrition education.

Promoting physical activity

a) Promote physical activity through activities of daily living, including through "active transport" as well as through recreation, leisure and sport.

b) Develop sports leadership at multiple levels by different agents, including within professional groups (both within and outside the health sector) in the community and for young children and all age groups if possible.

c) Implement mass media and social marketing strategies that are cost-effective to raise awareness and provide education and motivation (intention) towards physical activity, linking them to supporting actions for maximum benefit and impact.

d) Arrange regular sports competition in the slum involving all children and all age group if possible.

Conclusion:

This study provides an overview of burden of childhood obesity among representative sample of children between 6 and 15 years for the first time and can prove to be a benchmark for future comparisons by the public health personnel and decision makers.Socioeconomic conditions and age and gender differences were felt to be important contributors towards obesity in this study population. Childhood obesity is a global public health issue that needs urgent attention of health policy makers.Further research on risk factors for childhood obesity will help to monitor the trend in near future. This along with appropriate and robust health education programme will in the long run combat the alarming rise in the number of diabetics and hypertensive within the state in the recent past.

References

[1] Mei Z, Grummer-Strawn L M, Pietrobelli A, Goulding A, Goran MI, Dietz WH. Validity of body mass index compared with other body-composition screening indexes for the assessment of body fatness in children and adolescents. Am J ClinNutr 2002;75:978-85.

[2] Parsons IJ, Power C, Logan S, Summerbell CD. Childhood predictorsBof adult obesity: A systematic review. Int J Obesity RelatMetabDisord 1999;23:1-107.

[3] Power C, Lake JK, Cole TJ. Measurement and long-term health risks of child and adolescent fatness. Int J Obesity 1997;21:507-26.

[4] StyneD.M : Childhood obesity and adolescent obesity : PCNA, 2001; 48 : 823-847.

[5] Park K: Park's textbook of Preventive and Social Medicine: BanarsidasBhanot Publishers, 18th Edition, 2005; 316 319

[6] Al-Nuaim A.R, Bamgboye E.A, al-Herbish A: The pattern of growth and obesity in Saudi Arabian male school children. International Journal Of Obesity and related metabolic disorders, 1996; 20:1000-1005.

[7] Mo-Suwan L. Junjana C. Puetapaiboon A. : Increasing obesity in school children in Transitional society and the effect of the weight control programme. South East Asian Journal of Tropical Medicine and public health, 1993; 24: 590-594.

[8]Vedavathi S, Jayashree R, Rafi M: Prevalence of Overweight and Obesity in Affluent adolescent school girls in Chennai in 1981 and 1998. Indian Pediatrics, 2003;40;775-779.

[9] Kapil U et al : Prevalence of obesity among Affluent adolescent school children in Delhi. Indian Pediatrics :2002;Vol 39: 449- 452.

[10] KapilU.The problem of overweight and obesity. Proceedings of the UGC sponsored national seminar on obesity: A well fed undernourished
syndrome, Ernakulam, Kerala, India, 2004; p. 7-18.

[11]Kapil U, Singh P, Pathak P, Dwivedi SN, Bhasin S. Prevalence of obesity amongst affluent adolescent school children in Delhi.IndianPediatr 2002;39:449-52.

[12] Jelliffe BD. The Assessment of the Nutritional Status of the Community. Geneva: World Health Organization; 1966. p. 63-78.

[13] Centers for Disease Control and Prevention. Division of Nutrition, Physical Activity and Obesity, National Center forChronic Disease Prevention and Health Promotion Available from:
http://www.cdc.gov/obesity/childhood/defining.html. [Lastcited 2009 Dec 27].

[14] Ramachandran A, Snehalatha C, Vinitha R, Thayyil M, SathishKumar CK, Sheeba L, *et al*. Prevalence of overweight in urbanIndian adolescent school children. Diabetes Res ClinPractPanjikkaran and Kumari: BMI x waist-height ratio for obesity percentiles in children139 Indian Journal of Community Medicine / Vol 34 / Issue 2 / April 2009Practice 2002;57:185-90.

[15] Preetam B Mahajan, Anil J Purty,[1] Zile Singh,[1] Johnson Cherian,[1] Murugan Natesan,[1] Sandeep Arepally,[1] and V Senthilvel. Study of Childhood Obesity Among School Children Aged 6 to 12 Years in Union Territory of Puducherry.

[16] Rob Herbert. Available from: http://www.pedro.org.au/wpcontent/

uploads/CIcalculator.xls. [Last cited 2009 Dec 27].

[17]Beena Dave [1], Salvi Shah [1], Manali Shah [1], Anjan Desai [1], ParmitaKoli [1]Prevalence of Overweight and Obesity in School Going Children of Surat.

[18] Monga S: Obesity among school children (7-9 years old) in India, prevalence and related factors. The 132nd Annual Meeting (Nov 6-10, 2004) of APHA.

[19]S Kumar, DK Mahabalaraju, MS Anuroopa et al. Prevalence of Obesity and Its Influencing Factor among Affluent School Children of Davangere City Indian Journal of Community Medicine Vol. 1, No.1, January 2007.