International Journal of Contemporary Pediatrics
Dasgupta A et al. Int J Contemp Pediatr. 2017 Jul;4(4):1434-1438
http://www.ijpediatrics.com
pISSN 2349-3283 | eISSN 2349-3291

DOI: http://dx.doi.org/10.18203/2349-3291.ijcp20172681

Original Research Article

Influencers of childhood over nutrition: a cross sectional study among primary school children in Kolkata, West Bengal, India

Aparajita Dasgupta, Aritra Bhattacharyya*, Bobby Paul, Lina Bandyopadhayay

Department of Preventive and Social Medicine, All India Institute of Hygiene and Public Health, Kolkata, India

Received: 15 April 2017
Accepted: 09 May 2017

***Correspondence:**
Dr. Aritra Bhattacharyya,
E-mail: dr.aritra.bhattacharya@gmail.com

ABSTRACT

Background: Changing trends of dietary habits and lack of physical exercise force the world to face a modern era epidemic obesity which also affects our children counterpart. Childhood obesity is now a challenge of public health to combat with. Prevalence of childhood overnutrition (obesity and overweight) found to be rising in many developing countries including India in recent decades in many studies by different researchers, it is ranging from 2.9% to 14.3%, which makes our youth vulnerable to many life-threatening consequences.
Methods: It was a school based cross sectional study done in primary schools of Barasat among 548 students of 3-11 years of age group. Parental perception towards child eating behaviour were assessed with the help of CEBQ questionnaire.
Results: Among the total 548 students, as per BMI 38% were overweight and obese. Then hierarchical multiple logistic regression revealed that at Step one socio-demographic factors accounted for 16.9% of the variation in overnutrition status. Introducing the responses on selected life style factors in step two and CEBQ responses in final step explained an additional 9.9% and 5% of variation respectively. At all three-level model correctly predicted 62-70.3% of the dependent variables.
Conclusions: The high proportion of over nourished children were found in our study, and this found to be related with parental perception about few lifestyle and child eating behaviour which calls for further research and interventional programme for this alarming topic in this age group.

Keywords: Child eating behaviour questionnaire, Child hood obesity, Eating behaviour, Over nutrition, Parental perception

INTRODUCTION

Prevalence of childhood overnutrition (obesity and overweight) found to be rising in many developing countries including India in recent decades in many studies by different researchers, it is ranging from 2.9% to 14.3% which makes our youth vulnerable to many life-threatening consequences.[1] Childhood is the best time to determine the nutritional status and take action accordingly because this is the most fertile period of one's life when seeding of proper dietary habits and nutritional advice will bloom throughout his/her life and will also improve the total health of an individual as well as that of the whole nation. Therefore, early childhood is now recognised as a key target in the prevention of overweight and obesity, and the knowledge that children gain at this time about food and its health benefits can influence their dietary choices and preferences in later

life.[2] Parental attitude and their perception about child eating behaviour helps children to inculcate correct knowledge regarding healthy food.

Changing trends of dietary habits and lack of physical exercise force the world to face a modern era epidemic obesity which also affects our children counterpart. So, childhood obesity is now a challenge of public health to combat with. With this background, the present study was conducted among school children in a primary school of Kolkata to find out their nutritional status and parental perception towards child eating behaviour was also assessed in order to find out its influence, if any, on childhood over nutrition.[2,3]

METHODS

The present study was a school based cross sectional study conducted in four primary schools in Barasat Municipal area during July-October of 2016. The study population comprised of all children, (studying in Preparatory class, L.K.G, U.K.G, Class I, II, III and IV) who had attended the schools with their parents on the prefixed date of data collection. After taking prior permission from the Principals of the schools, an interview date with parents of all children studying in each school was fixed. On that day, data collection was done with self-administered questionnaire from parents. Pretesting of the questionnaire which were translated in local language (i.e. Bengali) and retranslated again, was done on 30 students of a different school of Barasat and essential corrections were made before commencement of the final study. Out of total enrolment of 590 children in all the four schools, 557 were included in the study as the students who were absent or did not attend with their parent and those whose parents did not give the informed written consent were excluded from the study yielding the response rate of 94.4%. However, data analysis was done on 548 as 9 parental questionnaires were incomplete.

Height and weight of each child was measured following standard operating procedure with the help of a non-stretchable measuring tape and properly calibrated weighing machine. The body mass index was calculated as weight in kg/height in m^2.

The parents of each student were assembled in a hall of the school, and after explaining the purpose of the study, informed written consent was obtained from them. Data collection was done with a self-administered questionnaire adopted from Children's Eating Behaviour Questionnaire (CEBQ). CEBQ has eight subscales and total 35 questions. The scale Desire to Drink (DD) was removed for cultural aspect of the acceptance of the study population. Food responsiveness and emotional overeating was taken together, so, the modified CEBQ, we adopt, had six sub classes and total 25 questions. The scales food responsiveness (FR) and enjoyment of food (EF) reflected eating in response to environmental food cues. Satiety responsiveness (SR) represented the ability of a child to reduce food intake after eating to regulate its energy intake. Slowness in eating (SE) reflected reduction in eating rate as a consequence of lack of enjoyment and interest in food. Food fussiness (FF) was defined as rejection of a substantial amount of familiar foods as well as new foods, thereby leading to the consumption of an inadequate variety of foods. The scales emotional overeating (EOE) and emotional under eating (EUE) implied either an increase or a decrease in eating in response to a range of negative emotions, such as anger and anxiety.[4] Each question of each domain was scored -1, 0 and 1 for always, sometimes and never. It was hypothesised that over nourished children would have higher scores on 'food approach' subscales (i.e. FR, EF, EOE) and lower scores on 'food avoidant' subscales (i.e. SR, SE, EUE, FF) of the CEBQ.

Data were entered and analyzed in Statistical Package for the Social Sciences (SPSS) version 20. Statistical significance for all analyses were set at $P < 0.05$. A three-step hierarchical multiple logistic regression model was built to find out factors associated with childhood overnutrition which was the dependent variable.

RESULTS

Out of 548 children, proportion of boys (50.7%) and girls (49.3%) were almost same and the age group ranged from 3 years to 11 years, of which children aged 4 and 5 years were more (24.5%in each category) and 11years were least, accounting for only 0.7%. Majority of the father's occupation were service (45.6%) and business (31.8%), whereas majority of the mothers were home makers (85.8%) and only 14.2% worked for pay. The median PCI was Rs. 3333.33. Among 548 students, 316 (57.6%) were normally nourished, 24 (4.4%) were underweight and 208 (38%) had overnutrition according to BMI, as per WHO standard (Figure 1).[5-9]

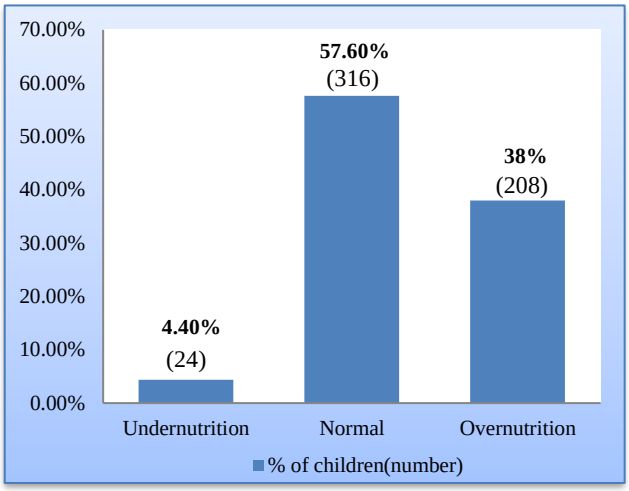

Figure 1: A simple bar diagram showing distribution of students according to their BMI (n=548).

In CEBQ questionnaire it was seen that most parents chose the two extreme options of the three likert scale (i.e. always and often) (Table 1). Three steps hierarchical multiple logistic regression was done with overnutrition as dependent variable. Socio-demographic factors (Age, sex and PCI) were entered at stage one accounting for 16.9% of variation in childhood overnutrition status and age, sex and PCI had significant odds of 1.503,1.455 and 1.491 respectively; responses on some parental perceptions and practices were entered in the second stage explaining an additional 9.9% of variation where age, sex, parental perception about their child's health status, importance of their guidance over child's food had significant odds of 1.476,1.790,3.505 and 0.167 respectively. In the final step, further addition of CEBQ responses (i.e. FF, EF, EOE, SR, EU, SE) explained an additional 5% of variation and all four variables with three new factors namely FF, EO and SR had significant odds of 1.108,1.227 and 0.902 respectively. At all three steps model was fit as shown by the non-significant Hosmer-Lemeshow statistic. At all four-level model correctly predicted 69-71.4% of the dependent variables. Overall R^2 was 0.318 in final model. (Table 2).

Table 1: Frequency distribution of parental perception on child eating behavior (by CEBQ questionnaire) (n=548).

Comments	Always	Sometimes	Never
Food fussiness (FF)			
My child refuses new foods at first.	308 (56.2%)	26 (4.7%)	214 (39.1%)
My child enjoys wide variety of foods	338 (61.7%)	2 (0.4%)	208 (38%)
My child enjoys tasting new foods.	404 (73.7%)	10 (1.8%)	134 (24.5%)
My chid is difficult to please with foods.	218 (39.8%)	14 (2.6%)	316 (57.7%)
My child decides that he/she doesnt like food,even without tasting it.	296 (54%)	10 (1.8%)	242 (44.2%)
Enjoyment of food (EF)			
My child loves to eat.	142 (25.9%)	34 (6.2%)	372 (67.9%)
My child is interested in food..	88 (16.1%)	0 (0%)	460 (83.9%)
My child is always asking for food..	42 (7.7%)	8 (1.5%)	498 (90.9%)
My child always looks forward to mealtime.	90 (16.4%)	12 (2.2%)	446 (81.4%)
Food responsiveness/emotional overeating (EOE)			
My child eats more when angry.	34 (6.2%)	16 (2.9%)	498 (90.9%)
My child eats more when s/he has nothing else to do.	77 (14.1%)	12 (2.2%)	459 (83.7%)
if allowed to, My child eats too much.	40 (7.3%)	6 (1.1%)	502 (91.6%)
even if My child is full up,s/he finds room to eat her/his favourite food.	186 (33.9%)	8 (1.5%)	354 (64.6%)
Satiety responsiveness			
My child leaves food on his/her plate at the end of a meal.	258 (47.1%)	2 (0.4%)	288 (52.6%)
My child has a big apetite.	94 (17.2%)	8 (1.5%)	446 (81.4%)
My child gets full up easily.	330 (60.2%)	34 (6.2%)	184 (33.6%)
My child gets full before his/her meal is finished.	366 (66.8%)	34 (6.2%)	148 (27%)
My child cannot eat a meal if s/he has had a snack just before.	341 (62.2%)	12 (2.2%)	195 (35.6%)
Emotional undereating (EUE)			
My child eats less when s/he is angry.	274 (50%)	72 (13.1%)	202 (36.9%)
My child eats less when s/he is tired.	396 (72.3%)	34 (6.2%)	118 (21.5%)
My child eats more when s/he is happy.	196 (35.8%)	42 (7.7%)	310 (56.6%)
Slowness in eating (SE)			
My child finishes his/her meal very quickly..	92 (16.8%)	0 (0%)	456 (83.2%)
My child eats slowly.	436 (79.6%)	4 (0.7%)	108 (19.7%)
My child takes more than 30 minutes to finish a meal.	286 (52.2%)	4 (0.7%)	258 (47.1%)
My child eats more &more slowly during the course of a meal.	272 (49.6%)	6 (1.1%)	270 (49.3%)

DISCUSSION

The present study revealed that prevalence of overnutrition (38%) was much higher than under nutrition (4.4%), which may be explained by change in the dietary habits, rapid urbanization, lack of physical activity etc. that is forcing our society to face the other side of malnutrition. A school based study done by Mishra A et al in 2011 reported the prevalence of overweight and obesity among 8 and 18-year-old children, as 18.5% and 5.3% using WHO cut-off values.[10]

Table 2: Hierarchical multiple logistic regression showing Factors associated with overnutrition (n=548).

Variables		Step 1 OR (CI)	Step 2 OR (CI)	Step 3 OR (CI)
Age		1.503 (1.347-1.676)*	1.476 (1.315-1.656)*	1.435 (1.263-1.631)*
Sex	Girls	1.455 (1.004-2.110)*	1.790 (1.202-2.666)*	1.729 (1.138-2.626)*
PCI (median PCI=3333.33)	≥3333.33	1.491 (1.028-2.162)*	1.278 (.843-1.937)	1.195 (0.773-1.847)
Tiffin from shop in last week	≥3 days		1.142 (0.743-1.755)	1.334 (0.833-2.134)
Parental perception about health status	Obese		3.505 (2.334-5.263)*	3.002 (1.966-4.584)*
Parental perception about absence of guidance	Become obese		5.988 (1.878-19.097)*	4.960 (1.461-16.836)*
Food Fussiness				1.108 (1.025-1.197)*
Enjoyment of Food				1.081 (0.939-1.243)
Emotional Over Eating				1.227 (1.049-1.437)*
Satiety Responsiveness				0.902 (0.827-0.983)*
Emotional Undereating				1.009 (0.884-1.152)
Slowness in Eating				1.030 (0.920-1.154)
Nagelkarke R^2		0.169	0.197	0.318

OR=Odds ratio; CI=Confidence Interval ; *= Statistically significant ($p<0.05$).

Another study conducted among 24,842 school children in South India by Raj M et al showed that the proportion of overweight children increased from 4.94% of the total students in 2003 to 6.57% in 2005 demonstrating the time trend of this rapidly growing epidemic.[11]

In this study, it was found that child's overnutrition status was well predicted by their eating behaviour. In hierarchical multiple logistic regression, FF, EOE and SR had significant association with the dependant variable. These findings are in concurrence with Sleddens E et al done on Dutch children, who reported that BMI z-scores were positively associated with the 'food approach' subscales of the CEBQ (EF, EOE) (β's 0.15 to 0.22) and negatively with food avoidant subscales (SR, SE, EU, FF) (β's -0.09 to -0.25).[4] They found significant relations with child BMI z-scores for FR, EF, SR and SE.

In this study, it was found that perception of parents about their child's health status, importance of their guidance over child's food and number of days they took tiffin from shop have significant effects on predicting the overnutrition status of children, which was a novel finding. These factors were unexplored till now, with this finding we hope it will explain so called unexplained factors influencing on child hood overnutrition status. Keeping these factors in mind we may intervene timely and can control our future generation from facing a frightening era of NCDs.

CONCLUSION

High proportion of over nourished children was found in our study, and this found to be related with child eating behaviour and their food preference which calls for further research and interventional programme for this alarming topic in this age group.

ACKNOWLEDGEMENTS

Authors would like to thank Knowledge Home school Barasat, specially Mrs. Gayatri Bhattacharyya and Mrs. Swagata Bhattacharyya.

Funding: No funding sources
Conflict of interest: None declared
Ethical approval: Not required

REFERENCES

1. Soni S, Thawani R, Idhate T, Kalra M, MAHAJAN A, Aslami A et al. Research letters. Indian Pediatr. 2016;53(8):741-4.
2. Zarnowiecki D, Dollman J, Sinn N. A tool for assessing healthy food knowledge in 5-6-year-old

Australian children. Public Health Nutri. 2011;14(07):1177-83.
3. Wardle, J, Guthrie CA, Sanderson, S and Rapoport, L. Development of the Children's Eating Behaviour Questionnaire. J Child Psychol Psychiatr. 2001;42:963-70.
4. Sleddens E, Kremers S, Thijs C. The Children's Eating Behaviour Questionnaire: factorial validity and association with Body Mass Index in Dutch children aged 6-7. International J Behav Nutr Physic Activ. 2008;5(1):49.
5. BMI for boys of 2-5 yrs age. Available at: http://www.who.int/childgrowth/standards/bmi_boys_2_5_zscores.txt.
6. BMI for girls of 2-5 yrs age. Available at: http://www.who.int/childgrowth/standards/bmi_girls_2_5_zscores.txt
7. Bmi_girls_perc_WHO2007_exp. Available at http://bmi_girls_perc_WHO2007_exp. Accessed 15 September 2016.
8. BMI-for-age BOYS 5 to 19 years (z-scores) Available at http://bmifa_boys_5_19years_z. Accessed 15 September 2016.
9. BMI-for-age GIRLS 5 to 19 years (z-scores). Available at http://bmifa_girls_5_19years_z Accessed 15 September 2016.
10. Misra A, Shah P, Goel K, Hazra DK, Gupta R, Seth P, et al. The high burden of obesity and abdominal obesity in urban Indian schoolchildren: A multicentric study of 38,296 children. Ann Nutr Metab. 2011;58:203-11.
11. Raj M, Sundaram KR, Paul M, Deepa AS, Kumar RK. Obesity in Indian children: Time trends and relationship with hypertension. Natl Med J India. 2007;20:288-93.

Cite this article as: Dasgupta A, Bhattacharyya A, Paul B, Bandyopadhayay L. Influencers of childhood over nutrition: a cross sectional study among primary school children in kolkata, West Bengal. Int J Contemp Pediatr 2017;4:1434-8.