



## **A Cross sectional study on the Prevalence of Underweight among the children of Government Primary schools in Pulianthope Zone, Chennai 2012.**

**JAI GANESH**

Department of Community Medicine, MADRAS MEDICAL COLLEGE AND GOVERNMENT GENERAL HOSPITAL

**Abstract :** Background Childhood is a period of rapid growth after infancy. Among children the nutritional requirements increase because the growth rate increases. One of the major Public health problems in many developing countries including India is widespread prevalence of under nutrition among Primary school children. Chronic under nutrition is associated with slower cognitive development and serious health impairments, later in life that reduce the quality of survival. Early detection of the morbidities through regular survey helps in prompt treatment and prevention of serious complications. This study was conducted to assess the prevalence of underweight among the Government Primary School children in a zone of Chennai. Objective To assess the prevalence of underweight based on Body Mass Index percentiles (NCHS CDC) among the Government Primary School children in Pulianthope zone of Chennai. Materials and Methods A Cross-sectional study was done among 320 Primary school children both boys and girls aged 6 to 10 years studying in I V stds in Government Primary schools in Pulianthope Zone, Chennai during August 2012. Multi stage random sampling was used. Anthropometric measurements like Height and weight were recorded.

Underweight was defined as BMI 5th percentile for age sex (NCHS CDC 2000). Results The overall prevalence of underweight was 54.3. It was higher among girls (63) than boys (47) and it was statistically significant. Conclusions Under nutrition is an important public health problem in many developing countries including India. This problem has serious long term consequences for the child and adversely influences development of a nation. To solve this emerging public health problem a strong multidisciplinary action to be implemented at school, community, State and National level. There is an emphasis on the school health programs to focus on Health education on nutrition, Nutrition education to the parents and early detection as well as the treatment of under-nutrition.

**Keyword :** Underweight, Body Mass Index, Primary school children

### **Introduction**

Children constitute the nation's future human resources and Children are an important part of the total community. They can affect the health of the community, and the community in turn can affect them. Childhood is a period of rapid growth after infancy. Among children the nutritional requirements increase because the growth rate increases. The monitoring

of children's' nutritional status is a fundamental tool for the evaluation of their health condition. One of the major Public health problems in many developing countries including India is widespread prevalence of under nutrition among Primary school children (1). Chronic under nutrition is associated with slower cognitive development and serious health impairments, later in life that reduce the quality of survival (2). Early detection of the morbidities through regular survey helps in prompt treatment and prevention of serious complications. According to National Center for Health Statistics (NCHS) and Centers for Disease Control and Prevention (CDC) gender specific growth chart 2-20 years, if the BMI (Body mass Index) for age percentile is less than 5th percentile, the child is said to have underweight (3). For children BMI, age percentile is used, as amount of body fat changes with age and amount of body fat is different between girls and boys. There is limited data on Underweight among the Primary school children in our state. So this study was conducted to assess the prevalence of under nutrition among Government primary school children in a zone of Chennai.

### **Objective:**

1. To assess the prevalence of Underweight among the children of Government Primary schools in Pulianthope zone of Chennai.

### **Materials and Methods:**

#### **Study design:**

Cross-Sectional study.

#### **Study area:**

Government Primary Schools, Pulianthope Zone

#### **Study population:**

Children studying from I- V std

Exclusion criteria: Children absent on that day

#### **Study period**

August 2012

#### **Sample size**

A study done by Izharul Hasan, et al (3) in Bangalore reported that the overall prevalence of underweight among Government Primary School Children was 58.2%

Sample size  $N = Z^2 P \times Q$

d2

$P = 58\%$   $Q = 42\%$  d allowable error of 10% of 58% = 5.8,

Sample size  $N = 1.96 \times 1.96 \times 58 \times 42 = 278$

$5.8 \times 5.8$

assuming 10% non responsiveness the sample size for the study was 310.

#### Sampling method:

Multi stage random sampling method was used for this study. Among the districts of Tamil Nadu Chennai district was chosen randomly. Chennai district consist of fifteen zones. Among the fifteen zones of Chennai, Pulianthope zone was chosen randomly by lottery method. Pulianthope zone contain 19 Chennai Primary Schools. From the 19 schools, schools were randomly chosen by lottery method according to the needed sample size. The first number in the lottery was 7, and the corresponding school was C.P.S (Chennai Primary School) V.O.C Play Ground, The next number was 13, and the corresponding school was C.P.S STRAHANS ROAD Tamil, followed by the number 2, and the school was C.P.S T.V.K Nagar. There were 95 students, 121 students, 148 students enrolled in I II and III Schools respectively (Total = 364). This schools caters to the children belonging to families with lower socio-economic status and is under the coverage of school health services of the urban Health post situated a Kilometer away. All the children in I to V stds were included and children who were absent on the day of the study which constituted of 15 in I School, 17 in II School and 12 in III School were excluded and **finally 320 children** were examined in all the three schools. Absenteeism on the day was 12% and it was less in I to III stds but was high in IV and V std and high among the girls.

#### Data collection & Analysis:

This study was conducted after obtaining the permission from the School Headmasters. Anthropometric measurement like Height using the portable stadiometer accurate to 1 mm was measured. The children with bare foot were made to stand on a flat floor with feet parallel and with heels, shoulders and back of head touching the wall. Weight was measured in kilograms using electronic digital weighing machine to the nearest measure of 0.1 kg. The children were weighed with minimal clothing, without foot wear. Body Mass Index (BMI) for each child was calculated according to 'Quetelets' Index which is a statistical correlation of the relationship between the height and weight of an individual arrived at by dividing body weight (kg) and height in m<sup>2</sup>. For children BMI, age percentile is used, as amount of body fat changes with age and amount of body fat is different between girls and boys. According to National Center for Health Statistics (NCHS) and Centers for Disease Control and Prevention (CDC) gender specific growth chart 2–20 years, if the BMI for age percentile is less than 5th percentile, the child is said to have underweight (3). Data was recorded in Microsoft Excel and results were analyzed using SPSS. Chi Square test and Fishers Exact test used and p value < 0.05 was considered as statistically significant. The school authorities were informed about the health status of the students at the end of this study as well as recommended to inform the parents and refer those who were identified to have underweight to the nearby ICDS in Pulianthope for further management.

#### Results:

The age of the children was ranged from 6 – 10 yrs. The age distribution of children was shown in figure 1 and the age distribution according to sex was shown in Table 1. Regarding the gender, 52 % were boys and 48% were girls.

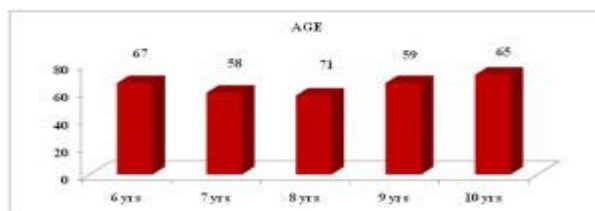


Table 1: Age distribution of children according to sex

Age in years	Boys (167)	Girls (153)	Total (320)
6 yrs	32 (19%)	35 (23%)	67 (21%)
7 yrs	29 (17%)	29 (19%)	58 (18%)
8 yrs	38 (23%)	33 (21%)	71 (22%)
9 yrs	30 (18%)	29 (19%)	59 (19%)
10 yrs	38 (23%)	27 (18%)	65 (20%)

The overall prevalence of underweight was 54.3% (95% C.I 48.9 to 59.7), Normal weight was 39.6% and overweight was 6.1%.

Table 2: Nutritional status of children according to BMI Percentile:

Nutritional status based on BMI (Total N = 320)	Boys (167)	Girls (153)	Total (320)
Underweight ( BMI <5 <sup>th</sup> percentile)	78 (47%)	96 (63%)	174 (54.3%)
Normal weight ( 5 <sup>th</sup> – 85 <sup>th</sup> percentile)	80 (48%)	47 (31%)	127 (39.6%)
Overweight ( > 85 <sup>th</sup> percentile)	9 (5%)	10 (6%)	19 (6.1%)

Fig 2: Prevalence of underweight according to sex

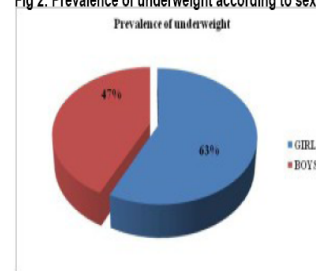


Table 3: Comparison of underweight among the boys and girls

	Underweight		Total (N = 320)	Chi square value ( P Value)
	Present	Absent		
BOYS	78 (47%)	89 (53%)	167	8.26 ( 0.00)
GIRLS	96 (63%)	57 (37%)	153	

Chi square 8.26 df 1 P < 0.05 Significant

Underweight was high among girls (63%) than boys (47%) and this difference was found to be statistically significant (Table 3). The age wise prevalence of underweight was shown in Table 4.

Table 4: Comparison of Prevalence of Underweight according to age

Age-wise prevalence of underweight	Underweight		Total = 320
	Present	Absent	
6 years	21 (31%)	46 (69%)	67
7 years	34 (59%)	24 (41%)	58
8 years	44 (62%)	27 (38%)	71
9 years	38 (64%)	21 (36%)	59
10 years	36 (56%)	29 (44%)	65

Chi square 18.76 df 4 P < 0.05 Significant

From Table 4 it was found that the prevalence of underweight was increased with age and it was statistically significant at  $P < 0.05$ .

#### Discussion

Improved child health and survival are considered universal humanitarian goals. In this respect, understanding the nutritional status of children has far-reaching implications for the better development of future generations. The present study assessed the prevalence of underweight among children aged 6- 10 years using the BMI percentiles (NCHS & CDC). The overall prevalence of underweight was 54.3% and it was higher among girls (63%) than boys (47%). A study done by Izharul Hasan, et al (3) reported the overall prevalence of underweight among primary school children was 58.2% and 52%. In another study, Joseph et al (4) from rural areas of Karnataka state reported prevalence of underweight as 60.4%. A study by Sutanu dutta chowdhury et al (5) found that underweight was high among girls than boys, similarly in this study also underweight was high among girls than boys. Studies done by Sanjay Mandot et al (6) and Sutanu dutta chowdhury et al (5) reported that under nutrition in school children may be attributed by low socio economic status, poor dietary intake and lack of knowledge about nutrition in the family. Similarly this study was conducted among Government primary school children who have been coming with the background of low socio economic status, poor dietary intake and lack of knowledge about child rearing practices among parents etc.

Gopal et al (7) recommended that there is a need to revise the current norms used in ICDS programs like increasing the amount of food supplementation and Zalilah et al (8) recommended that active growth monitoring of the school children should be implemented, as it is an easy and inexpensive tool for health professionals to obtain information on the health and nutrition of the school-age population. This study which was conducted in a Government Primary schools is a preliminary step to assess the burden of underweight among the children who are the vulnerable sector of the population. Improvement in diet, as well as treatment and prevention of infections and infestations along with nutritional supplementation will definitely improve the nutritional status of the children from underprivileged sections of the society (9). Further studies which are community based, exploring the socio-demographic factors and nutritional determinants of the underweight among children will throw more light on this public health problem

#### Conclusion:

Under nutrition is an important public health problem in many developing countries including India. This problem has serious long term consequences for the child and adversely influences development of a nation. In spite of mid day meal scheme and regular school health services, the problem of underweight is still high among Government Primary School children. To solve this emerging public health problem a strong multidisciplinary action to be implemented at school, community, State and National level. There is an emphasis on the school health programs to focus on Health education on nutrition, Nutrition education to the parents and early detection as well as the treatment of under-nutrition. There is strong need for the coordination of Health & Education Departments to provide Nutritional supplementation along with regular assessment to monitor the Health status of the children.

#### References:

1. Kaushik Bose, Dilip Bhunia, Ganesh Paul, Ashish Mukhopadhyay and Raja Chakraborty Age and Sex Variations in Undernutrition of Rural Bengalee Primary School Children of East Midnapore District, West Bengal, India. Human Ecology Special Issue No. 14: 71-75 (2006)
2. Scrimshaw NS. The new paradigm of public health nutrition. Am J Pub Health. 1995 May; 85(5):622-4.
3. Izharul Hasan, Mohd Zulkifle, and Abdul Haseeb Ansari. Prevalence of stunting among school children of Government Urdu Higher Primary Schools in Azad Nagar and its surrounding area, Bangalore International Journal of Medicine and Medical Sciences Vol. 3(10), pp. 304-310, 12 October, 2011

4. Josheph B, Rebello A, Kullu P, Raj VD. Prevalence of malnutrition in rural Karnataka, South India:

A comparison of anthropometric indicators. Indian J. Health Popul. Nutr., 2002 Sep;20(3):239-44

5. Sutanu dutta chowdhury, Tarun chakraborty and Tusharkanti ghosh Prevalence of Undernutrition in Santal Children of Puruliya District, West Bengal, INDIAN PEDIATRICS, 2008 Jan;45(1):43-6.

6. Sanjay Mandot, Deepika Mandot and Jityendra Kumar Sonesh ,Nutritional Status of Tribal (Garasia) School Children of Sirohi District, Rajasthan , INDIAN PEDIATRICS, 2009 May;46(5):437- 8.

7. Gopal Chandra Mandal Kaushik Bose Assessment of Overall Prevalence of Undernutrition Using Composite Index of Anthropometric Failure (CIAF) among Preschool Children of West Bengal, India Iran J Pediatr Sep 2009, Vol 19 (No 3), Pp: 237-243.

8. Zalilah Mohd Shariff, Jenny Taylor Bond and Nan E. Johson Nutritional Status of Primary School Children from Low Income Households in Kuala Lumpur , Mal J Nutr 6 : 1 7-32, 2000.

9. Ferrar K, Olds T. Thin adolescents: Who are they? What do they do? Socio-demographic and useof-time characteristics. Prev Med 2010 Sep-Oct;51(3-4):253-8.



