

## A Study on Nutritional Status and Micronutrient Deficiencies among Primary School Children

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### **Abstract:**

**Background:** Micronutrients are essential for adequate physical and intellectual growth of children, however little information is available on micronutrient status of school children in Visakhapatnam. The present study was designed to know the nutritional status and micronutrient deficiencies among primary school children.

**Methods:** A cross-sectional study was conducted among 120 children from two Government schools. Children studying from 1<sup>st</sup> to 5<sup>th</sup> standard who were present in the school at the time of study were included. Information was obtained using a pre-tested questionnaire.

**Results:** The prevalence of under nutrition was found to be 60%, of which 36.8% were moderate to severely under-nourished. Most of the children belong to lower middle (46.7%) and upper lower (51.6%) income groups. About 60% of the parents of the children were illiterates. Vitamin A deficiency (bitot's spots) was seen in 19.49% of children. Nutritional anemia (palmar pallor) was found in 17.4%.

**Key Words:** Anaemia, Micronutrient Deficiency, Nutritional Status, Preschool children, Vitamin A deficiency.

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### **I. Introduction**

Approximately 826 million people in the world are under nourished of whom 792 million people were in the developing world and 34 million in the developed world. John Mason and colleagues claimed that 32% of the global disease burden could be removed by eliminating malnutrition.

In a developing country like India, various forms of malnutrition affect a large segment of population. Both macro and micro nutrient deficiencies are of major concern. Stunting and wasting are wide spread among school age children in developing countries and this is associated with several adverse outcomes throughout life. The main nutritional problems of the school age children include stunting under weight, anemia, iodine deficiency and Vitamin 'A' deficiency. In countries experiencing the nutrition transition, over weight and obesity are increasing problems in the school age children. [1]

Malnutrition among school age children is due to inadequacies in one or more of the three main preconditions for good nutrition: food, care and health. Several micronutrients are required for adequate growth among children. Vitamin 'A', Zinc and iron deficiencies have been demonstrated to cause growth faltering.

According to FAO reports 15% of the world population excluding China, are malnourished of which about 300 million live in South Asia where they constitute to one third of total population. Malnutrition main victims are children under the age of 15 and the children under the age of 5 years are hit the hardest. The school age period is nutritionally significant because this is the prime time to build up body stores of nutrients in preparation for rapid growth of adolescence. Hence the present study was carried out to assess the nutritional status among the primary school children.

### **II. Objectives**

1. To know the socio demographic profile of study population.
2. To know the prevalence of under nutrition in the study population.
3. To study the prevalence of Vitamin A deficiency and nutritional anaemia in the study population.

### **III. Methodology**

A cross sectional descriptive study was conducted among primary school children of Greater Visakhapatnam Municipal Corporation Andhra Pradesh during the months of Dec'2013 and Jan'2014. Two Government Primary schools were selected from the Greater Visakhapatnam Municipal Corporation by a simple random sampling technique. Children who were present at the time of visit and willing to participate were included in the study. A total of 120 children were studied. A pre tested semi structured questionnaire was used for collecting the data. Permission was taken from the Head Master of the concerned schools before

conducting the study. Anthropometric measurements were taken with the help of flexible measuring tape and weighing scale. Clinical signs (palmar pallor, bitot's spots) were taken into consideration for assessing the Micronutrient deficiencies. Data was analyzed using Microsoft Excel and represented in the form of tables and figures.

#### IV. Results

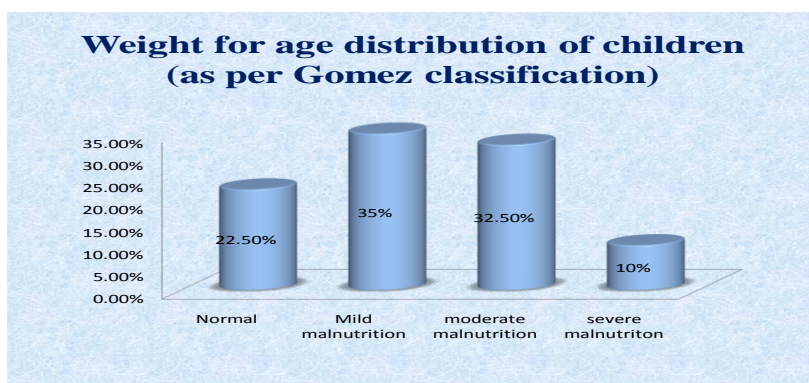
A total of 120 children were studied. The age of the children ranged from 5 years to 12 years. 87% of the children were 10 years and below and the mean age of the study population was found to be 7.9 years. 59% of the children were boys.

52% of the children were from upper lower class and 47% were from lower middle class. Majority of the study population were Hindus (78%).

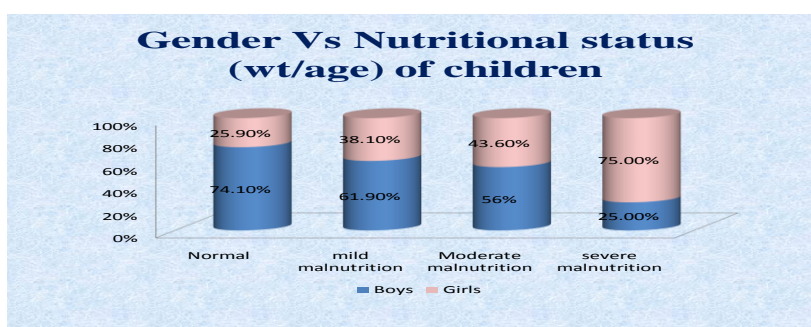
**Table No: 1** Socio Demographic Profile Of Study Population

AGE	NO. OF CHILDREN n=120	%
5- 6 YEARS	31	25.83
1-8 YEARS	45	37.6
9-10 YEARS	28	23.3
11-12 YEARS	16	13.3
<b>GENDER</b>		
MALE	71	59
FEMALE	49	41
<b>Socioeconomic Status</b>		
Upper middle	1	1
Upper Lower	63	52
Lower Middle	56	47

In the present study, the prevalence of under nutrition was found to be 77.5%. 10% of children were having severe malnutrition, 32.5% were having moderate malnutrition (Fig1) according to Gomez classification. The prevalence of under nutrition was found to be high in males (mild and moderate) than females (Fig: 2) whereas severe malnutrition was more in females than males. The under nutrition was highly prevalent in the age group of 11 to 12 years followed by 9 to 10 years ( Fig:3) As per Waterlow's classification of malnutrition of height for age distribution, stunting was found to be about 48% and moderate to severe impairment of height for age was seen in 5% of the children. (Fig: 4). The stunting was found to be more in males than females (Fig:5) and was more in the age group of 11 to 12 years followed by 7 to 10 years (Fig:6).



**Fig No: 1**



**Fig No: 2**

### Age Vs nutritional status (wt/age) of children

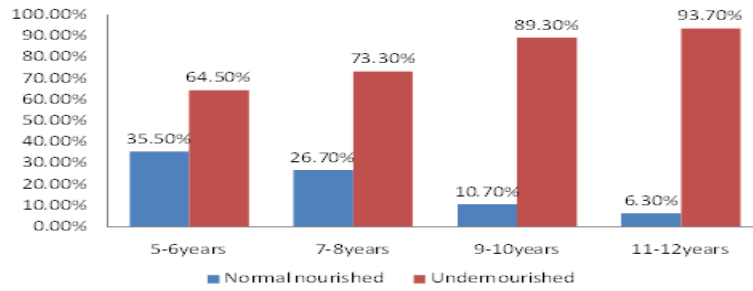


Fig No:3

### Height for age distribution of children (as per Waterlow's classification)

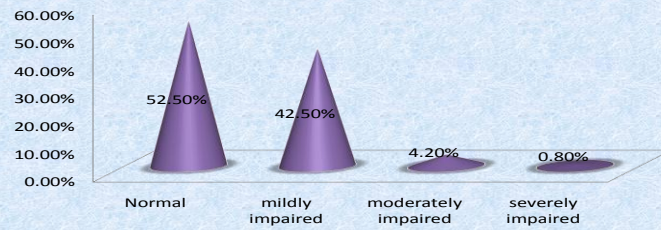


Fig No: 4

### Gender vs Nutritional status (ht/age) of children

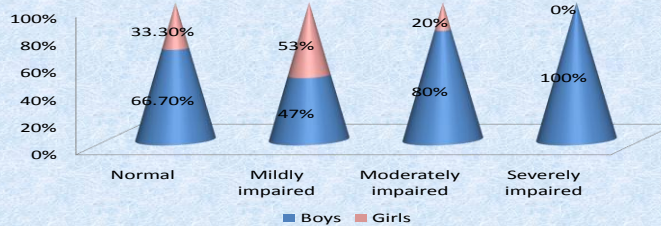


Fig No: 5

### Age vs nutritional status (ht/age) of children

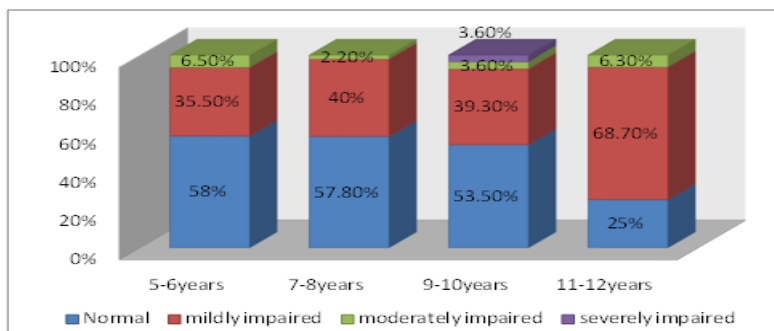


Fig No:6

In the present study 50% of the children were found to be anaemic clinically and was more in female children (29%) than male children (21%). The prevalence of Vitamin 'A' deficiency in the present study was found to be 19% and it was found to be more in the male children (11.6%) than female children (7.5%).

## V. Discussion

Under nutrition and micronutrient deficiencies continue to be the major health problems in developing countries particularly in the children, adolescents antenatal and post natal mothers. Under nutrition is one of the important risk factor for mortality and morbidity in children. For children in developing countries, under nutrition is an important health problem with prevalence rates estimated to range from 4% to 46% with 1 to 10% severely malnourished [4]. The results of the present study showed that the prevalence of under nutrition was found to be 77.5% with 10% children were having severe malnutrition, 32.5% were having moderate malnutrition (Gomez classification). However it was much higher when compared to other studies conducted at Nairobi, Kenya (14.9%)[2], a rural area of Khammamin A.P. [3](31.66%) and North West Ethiopia (21%).[4]

In the present study the prevalence of stunting (Waterlow's classification) was found to be about 48% was consistent with other studies conducted at Africa Region (20.2 to 48.1%) and Asia (32.8 to 43.7%).[1] Low prevalence of stunting was observed in other studies conducted at Nairobi, Kenya [2] (24.5%) and North – West Ethiopia (23%).[4]

In the present study 50% of children were found to be anaemic clinically and anaemia was high in girls (29%) than boys (21%). Similar finding was observed by a study done by Verma et al in Punjab,[5] India where 51.5% of the children were anaemic. Similarly in the study by Aditya S et al in Andhra Pradesh [3] where 43.8% of the children were anaemic. However this was lower when compared to the study conducted in primary school children of rural West Bengal (66%)[6] and was found to be more or less equal in both boys (62.6%) and girls (69.6%). In contrary to this, in the study conducted by Phani Madhavi et al, the prevalence of anaemia among school children was 28.9%. [7]

The prevalence of Vitamin A deficiency was 19% in the present study which was assessed clinically by the presence or absence of Bitot's spots. This was high when compared to other studies done on prevalence of Vitamin A deficiency among preschool children in India. It can be justified as in some children; Bitot's spots can persist even after the Vitamin A deficiency has been corrected, so one cannot accurately assume that the sign was indicative of current Vitamin A deficiency. According to WHO report, 2009, approximately one third of the world's preschool population is estimated to be Vitamin A deficient, with highest prevalence (44-50%) being reported in regions of Africa and South-East Asia.[8]. In a study conducted by Sachdev et al, the prevalence of clinical VAD was 9.1% among preschool children of Aligarh District, Uttar Pradesh. [9]. Similarly in the study done by Sinha et al in Central India, the prevalence of Vitamin A deficiency among urban school children was 6.5%. [10]

## VI. Conclusions

Under nutrition including micronutrient deficiencies is still commonly seen in school going children affecting their holistic growth even though mid-day meal program is operational. Early identification and measures to combat deficiencies through school health program will improve growth and performance of the future work force

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