A Study of Prevalence of Malnutrition In Government School Children In The Field Area of Azad Nagar Bangalore, India

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Abstract: Malnutrition is a problem at varying proportions in developing countries, and anthropometry is a simple tool to assess its magnitude in children. This study was aimed at identifying the prevalence of malnutrition among 500 children of govt schools of Azad Nagar, Bangalore south Asia. The value of using various field based formulae and of various anthropometric indicators used for classification of malnutrition was also studied. The study was focused on children aged 8-14 years studying in class 1st to 8th in govt schools. Anthropometric data and eating practices of children were collected with the help of a pretested questionnaire and food intake diary. Selected anthropometric measurements were taken using standard techniques. Their Body Mass Index (B.M.I) for age was calculated and compared with WHO (2007) standards. Compared to WHO standards, mean BMI of school children in Azad Nagar and its surrounding area was inferior at all ages. The prevalence of malnutrition was 68%, males recorded a relatively high rate of malnutrition 57.94% (197) than females 42.06% (143). The study reveals that the average of govt school children in Azad Nagar are underweighted. Poor nutrition of children do not only affects the cognitive development of children but also likely to reduce the work capacity in future.

Key words: School children, BMI, Undernutrition

I. INTRODUCTION

In large areas of the world today, malnutrition, especially that affecting young children, is one of the principal public health problem in developing countries. Growing children in particular are most vulnerable to its consequences. The frequency of malnutrition cannot be easily estimated from the prevalence of commonly recognized clinical syndromes, such as Kwashiorkor and Marasmus because these constitute syndromes only, the proverbial tip of iceberg. Case with mild to moderate malnutrition are likely to remain unrecognized because clinical criteria for their diagnosis are imprecise and are difficult to interpret accurately. Anthropometry can be sensitive indicators of health, growth and development in infants and children. Anthropometry is the single most universally applicable, inexpensive and non-invasive method available to assess the size, proportion and composition of human body (W.H.O., 1995).

According to W.H.O., the ultimate intention of nutritional assessment is to improve human health (Beghin et al., 1998). Malnutrition which refers to an impairment of health either from a deficiency or excess or imbalance of nutrients is public health significance among children all over the world. There is no doubt that diet has profound influence on human health, at all ages and affecting all medical subspecialities. Defining and influencing nutritional status is, however very complicated. Adequate food and nutrition are essential for proper growth and physical development to ensure optimal work capacity, normal reproductive performance, adequate immune reactions and resistance to infections. Inadequate diet may produce severe forms of malnutrition in children, Vit A deficiency and Iodine deficiency disorders. World Health Organization (W.H.O., 1995) has recommended various indices based on anthropometry to evaluate the nutritional status of the school aged children. It has now been established that the Body Mass Index (BMI) is the most appropriate variable for nutritional status among adolescents (WHO, 11995; Himes and Boucher, 1989; Must et al., 1991; Roland. Cachera, 1993). Several studies have investigated nutritional status of adolescents from different parts of the world (Kurz,2006; Cookson et al; Venkainsh et al, 2007; Ahmed et al, 2000). However, there is paucity of anthropometric indices based information on nutritional status of govt school children in Azad Nagar. Moreover, to date there are no studies which have dealt with sex differences in the level of malnutrition among govt school children in Azad Nagar. The present study was attempted to evaluate the overall prevalence of malnutrition, to recommended measures for correction of the nutritional deficit of the vulnerable populations group and to provide a baseline data for future research. In short, the nutritional assessment of a community aim at discovering factors and guiding action intended to improve nutrition and health. This study is carried out to estimate the prevalence of malnutrition among children 8-14 years and to compare the commonly used anthropometric indicators in terms of their sensitivity and specificity.

II. MATERIAL AND METHODS

The present study was carried out between January and June 2010. The data were collected from govt higher primary schools of Azad Nagar and its surrounding areas. Necessary approval was obtained from the school authorities prior to the commencement of the research. A total of 500 pupils (382 boys and 118 girls) aged 8-14 years participated in the study. This study was cross sectional in nature and the subjects were selected through random sampling...
procedures, aimed at know the prevalence of malnutrition and nutritional status in govt higher primary schools children in the field area of Azad Nagar, and to create awareness among higher primary school children, school teachers and their parents regarding childhood malnutrition, its complications and preventions.

III. DATA COLLECTION

The data were collected by visiting govt higher primary schools on different visits and a particular day was fixed for the investigation, school staff was requested to collect all students of one or more classes on that fixed day. A semi structured, pre tested questionnaire was administered to each child to collect data on socio-demographic profile (Age, Sex, father’s and mother education, profession and income). Exact date of birth was verified from the school registers.

IV. ASSESSMENT OF NUTRITIONAL STATUS BY ANTHROPOMETRY

Anthropometry is the measurement of the human. It is a quantitative method and is highly sensitive to nutritional status; especially among children. Two basic variables (height and weight) and a single derived variable (Body Mass Index) have been used in the present report. All the anthropometric measurement were taken following the standard techniques recommended by (Lohmann et al,1998) and body mass index was determined by the CDC table for calculated Body Mass Index.

| Age (years) | Gender | Height( cms) | Weight( kg) | BMI Mean + S.D |
|-------------|--------|--------------|-------------|----------------|
| 8           | M(n=33) F(n=10) | 120 + 3.12 121.40 + 4.65 | 19.20 + 3.12 20.04 + 3.18 | 13.26 + 3.78 13.68+ 3.92 | 15.87 15.85 |
| 9           | M(n=61) F(n=13) | 123.12 + 5.33 122.10 + 4.84 | 21.10 + 4.52 20.90 + 6.12 | 13.94 + 4.19 14.04 + 3.70 | 16.68 16.32 |
| 10          | M(n=57) F(n=20) | 128.90 + 6.40 126.20 + 4.64 | 23.63 + 4.68 24.25 + 3.74 | 14.42 + 3.10 15.27 + 2.19 | 17.20 17.57 |
| 11          | M(n=50) F(n=23) | 131.12 + 6.44 131.90 + 3.18 | 26.10 + 4.70 27.04 + 3.13 | 15.20 + 3.42 15.78 + 2.19 | 17.84 17.36 |
| 12          | M(n=73) F(n=20) | 138.16 + 6.12 135.12 + 5.90 | 28.62 + 4.14 31.20 + 2.17 | 15.93 + 3.21 17.07 + 2.13 | 18.58 19.15 |
| 13          | M(n=58) F(n=21) | 143.10 + 4.12 35.84 + 3.10 | 32.70 + 4.12 35.84 + 3.10 | 15.99 + 3.27 17.04 + 3.54 | 19.35 19.88 |
| 14          | M(n=50) F(n=11) | 146.19 + 4.03 145.18 + 3.13 | 39.10 + 3.62 41.30 + 2.17 | 18.34 + 3.28 18.80 + 3.97 |

V. RESULTS

In the study population, the prevalence of malnutrition in govt schools was 68%. The findings were statistically insignificant as validated by Chi square test. In the present study 382 (76.40%) were male and 118 (23.60%) children were female. In this study the prevalence of malnutrition in males and females was 57.94% and 42.06% respectively. Observed difference was not statistically significant as revealed by Chi square test. In the age wise distribution of our study population, total number of children in the age of 8 years were 41(8.20%), in the age of 9 years were 74 (14.80%), in the age of 10 years were 77 (15.40%), in the age of 11 years were 73 (14.60%), in the age of 12 years were 93 (18.60%), in the age of 13 years 79 (15.80%) and in the age of 14 years were 61 (12.20%). Among the study population, 33 (6.60%) male and 10 (2%) female children was of 8 years, 61 (12.20%) male and 13 (2.60%) female of 9 years, 57 (11.40%) male and 20 (4%) female children of 10 years, 50 (10%) male 23 (4.60%) female children of 11 years, 73 (14.60%) male and 20 (4%) female of 12 years, 58 (11.60%) males and 21 (4.20%) female children of 13 years and 50 (10%) male and 11(2.20%) female children were of 14 years. In the distribution of the studied population
according to their class levels, 127 (25.40%) of class 5th, 123 (24.60%) of class 6th, 140 (28%) of class 7th and 110 (22%) were of class 8th. Among the study population, 410 (82%) children were Muslims, 60 (12%) of Hindus and 30 (6%) were Jain, Sikh and belonged to other religions.

### Prevalence of Malnutrition in Males and Females

![Prevalence of malnutrition in Males and Females](image1)

**Figure 1** Males and Females

The use and interpretation of growth measurements differ significantly according to whether they concern the individual or entire population. The selection and use nutritional status of children in a clinical setup, in emergency situations, such as natural and man-made calamities, and in growth monitoring of children. Deficits in one or more of the anthropometric indicators are regarded as evidence of malnutrition. Each indicator has its own merits and demerits, and each indicator is best suited for a particular situation. Anthropometry, for many years, has been the indicator of choice for use during emergency situations. Indicators such as weight-for-height or height-for-age, allow malnutrition to be classified into stunting and wasting. Stunting is highly prevalent in most developing countries. The worldwide prevalence of stunting varies considerably from 5% to 65% in developing countries. The mean height and mean weight of the present study at all ages were found to be much inferior when compared to NCHS (National Centre for Health Statistics, USA) standard which is the reference data recommended by WHO. Mean height and Mean weight of girls is 12-14 years were better than boys of the same age groups. This could be due to the earlier onset of pubertal growth spurt in girls than boys.

The relatively high prevalence of malnutrition observed among govt school children located in Azad Nagar may be due to inadequate dietary intake of food. Alongside, the fact that most of these children are from parents of low socio-economic background mainly laborers, fisherman, auto drivers, farmers and traders, who themselves attended poor schools and live in poor houses where unhygienic living standards, unsafe drinking water, low calories food, and insanitary conditions of the immediate environment prevail. Such environmental factors contribute to the survival of disease agents such as parasites, bacteria and viruses. After being infected by these organisms, these children loose the protein energy, iron and vitamins intake to the benefit of these disease agents which later adversely affect the growth and nutritional status of the individual. One study indicated that malnutrition in middle income or low socio-economic group children aged 6-16 years in Hyderabad was 10-13%. Children having a body height and weight < -2 SD of the NCHS growth standards were considered as malnourished. The rate of malnutrition observed among boys (57.94%) is distinctively lower than the findings of the IRC (International Rescue Committee) in kakuma, kenya where 75% of boys were found malnourished. On the other hand, the malnutrition (42.06%) observed among the girls and (57.94%) among boys demonstrated a higher rate of malnutrition.

### Conclusion

Current study show a high prevalence of malnutrition even among govt schools children in Azad nagar Bangalore.
Malnutrition is a health concern in this group and these are strong indications that micronutrients deficiencies might well exists among these children. However, adequate and recent information is lacking, especially with respect to micronutrient status, and data are only available from a number of small studies from Azad Nagar and its surrounding area that might not be representative for the general population. There is definitely a need for well-planned, large scale studies using standardized methodologies to estimate the prevalence of malnutrition and other micronutrients deficiencies. A comprehensive study including anthropometric data, biochemical data, clinical signs and dietary intake data among the same group of children will give a better insight into situation.

In shortly, the present study provides evidence that the average govt school children in Azad Nagar state Karnataka are malnourished. The children studying in govt schools do not realize their full genetic potential for growth and they are considerably malnourished than their counterparts of private schools. The need for more calories, protein and micronutrients like iron and vitamins for the children of govt schools cannot be overemphasized. Giving iron tablets or micronutrient fortification are not a solution of the problem in this situation, but what they need is more food which of good nutritive value. School lunch can be an ideal vehicle to achieve this end. A protective role from the govt and community leaders is the need of the hour.

VIII. REFERENCES

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