

## Nutritional Profile of Rural School Children.

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### ABSTRACT

**Background:** Children are not given an opportunity for better future due to lack of understanding of their nutritional and emotional needs, which affects not only the individual child's health but also nation's economic progress. **Methods:** A school based cross sectional study was conducted among primary school children in 6-14 years of age located in AJIMS field practice area pane-Mangalore. **Results:** The pilot study result showed 45 % morbidity. With this assumption using formula  $n = 4pq/d^2$  a sample size of 488 was calculated, thus a total of 500 students were included in the study. The key findings of our study are 53.4% were girls, and 53.4% of children belonged to Muslim community Majority of families belong to socio-economic class II 40.4%. **Conclusion:** School age is a critical time in the development of human beings and the School setting provides a strategic point of entry for improving child health, self-esteem, life skills and behaviour. Malnutrition is a condition of multifactor deprivation.

**Keywords:** Children, Health Status, Nutritional Status, Anaemia.

### INTRODUCTION

Children are assets of any nation; they form a significant section of society and are dependent. These children are not given an opportunity for better future due to lack of understanding of their nutritional and emotional needs. This affects not only the individual child's health, but also nation's economic progress. Several factors affect the nutritional status of this group. Among these the socioeconomic and demographic factors are associated with worldwide pattern of stunting and thinness.<sup>[1]</sup>

Malnutrition is a condition of multifactor deprivation. According to Jellife, the ecological factors leading to malnutrition are conditioning influences, cultural influences, socioeconomic factors; factors related to food production and intake as well as availability and utilization of health and others services.

Low birth weight and infections are the most important conditioning influences responsible for malnutrition, especially in small children. Diarrhoea, Acute respiratory infection, Vaccine Preventable Diseases (VPD) like measles, whooping cough and TB and helminthiasis are the common infections that initiate malnutrition and aggravate existing malnutrition.

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The most widely prevalent form of malnutrition among children is Protein energy malnutrition (PEM). Severe protein energy malnutrition often associated with infection contributes to high child

mortality in underprivileged communities. Further, early malnutrition can have lasting effects on growth and functional status.

Children are considered to be the backbone of the nation. There are concerted efforts to provide care to the children less than 5 years of age through various national maternal and child health programmes for example: ICDS, RCH etc. Apart from mid-day meal programme, which is being run by the government of India under the ministry of primary education, there are no special efforts for children in age group 6-14 years. Various types of government sponsored school health programmes have been launched from time to time but their progress and achievement have been very slow and incomplete. Their services are also limited to the urban and favourable schools. They thus remain a neglected group.<sup>[2]</sup>

### MATERIALS AND METHODS

A school based cross sectional study was conducted among primary school children in 6-14 years of age from May 2009 to July 2011, from randomly selected four rural schools out of eight schools located in AJIMS field practice area pane-Mangalore. A pilot study was conducted during July 2010 to August 2010 and the pilot study results showed 45 % of children were suffering from one or the other morbidity. With this assumption the following sample size with an acceptable error of 10% level of significance works out, using the formula  $n = 4pq/d^2$  a sample size of 488 was calculated, thus a total of 500 students were included in the study.

Nutritional status of children was assessed by Indian Academy of Paediatrics classification. It is the most popular classification in India proposed by IAP in 1972, which is calculated by a formula weight of child /expected weight of child of that

age X 100 and is graded or interpreted as follows normal or health if weight for age is >80% of expected, Grade I: PEM if weight for age is between 71% - 80% of expected, Grade II: PEM if weight for age is between 61%-70% of expected, Grade III: PEM if weight for age is between 51%-60% of expected, Grade IV: PEM if weight for age is <50% of expected.

The physical instruments used in the study were a weighing machine, portable anthropometric rod and Haemoglobin estimation was carried out by Sahli's method, as another method was not available. Study subjects with HB< 12 gm% was considered as anemic.<sup>[1]</sup>

Data was collected using pre-tested semi-structured questionnaire as well as interview-cum observation. Data was tabulated and analyzed with frequency distribution table using appropriate test of significance.

### RESULTS

Out of 500 children, there were 267 (53.4%) girls and 233 (46.6%) boys. In the study population, 53.4% of the children belonged to Muslim

Community followed by Hindus (44.6%). Majority of families belong to socio-economic class II (40.4%) and class III (29.2%). illiteracy was observed among 5.2% of mothers and 6.8% of fathers. 43% of children belonged to Joint family while 42% belonged to nuclear family.

In [Table 1] shows the comparative value of mean height and weight of both boys and girls. All the measurements consistently increased with age. From age 6-14 years, the mean height increased from 112.8 cm to 152.2 cm in girls, and from 114.19 cm to 135.98 cm in boys. In addition, the mean weight increased from 18.26 kg to 44.69 kg in girls, and from 18.57 kg to 44.85 kg in boys. The value for height of boys was higher than girls till the age 9 years and remained below the girls till the age 12 years. The value for weight of boys was slightly higher than girls till the age of 10 years, there after they lagged behind and remained below the girls up to 13 years. Spurt in mean height was observed between 6-7 years and 12-13 years of age in boys were as in girls it was observed between 8-9 years, 9-10 years and 10-11 years of age. Spurt in mean height was observed between 12-13 years in both the age group.

**Table 1:** Mean and Standard Deviation of Height for Girls and Boys (n=500).

Age in years	Boys			Girls		
	No:	Height Mean ± SD	Weight Mean ± SD	No:	Height Mean ± SD	Weight Mean ± SD
6	19	114.19±.631	18.57±0.879	15	112.85±1.245	18.26±0.549
7	21	124.21±9.535	23.97±5.873	18	119.78±2.557	20.61±1.132
8	36	126.22±3.921	23.97±2.908	41	121.72±17.240	23.30±0.827
9	19	130±4.341	26.48±1.265	33	130.32±3.276	26.48±1.265
10	37	135.09±7.110	30.09±1.946	45	131.10±21.815	30.84±1.588
11	17	139.24±6.340	31.03±4.215	19	141.55±1.957	30.97±3.268
12	27	140.35±12.959	34.96±2.598	26	146.60±1.393	36.54±0.824
13	37	151.22±1.877	44.54±19.854	38	146.66±5.712	43.00±11.845
14	20	156.22±8.707	44.85±5.896	32	152.28±8.141	44.69±6.082
Total	233	135.98±13.841	31.57±12.04	267	134.78±16.890	31.70±9.958

[Table 2] showed overall prevalence of malnourished was 41%. Majority 29% of malnourished children were having grade I malnutrition, followed by 9%, 2.2% and 0.8% of malnutrition was observed in Grade II, III and IV respectively. Prevalence of Malnutrition was more among girls (43.1%) compared to boys (38.6%). Grade I II were more in girls were as reverse findings were seen in grade III and IV.

[Table 3] The most common morbidity found in the under nourished children was Dental problems 71 (34.6%) followed by Vitamin deficiency 63 (30.7%) and ENT problems 34 (16.5%). Table showed that under nutrition children were having more morbidity compare to normal and the difference between the normal nutritional status and under nutrition in case of Vitamin deficiency, ENT problems, Respiratory infection, Gastro

intestinal diseases was found Statistically Significant. The difference between boys and girls with respect to malnutrition status was statistically

not significant. Indicating nutritional status has barring on health status but not the gender.

**Table 2 :** Comparison of Nutritional Status of boys and girls as per IAP Classification.

Weight for age per IAP Classification	Male		Female		Total	
	NO	%	NO	%	NO	%
Normal >80	143	61.4	152	56.9	295	59.0
Grade I 71-80	63	27.0	82	30.7	145	29.0
Grade II 61-70	19	8.2	26	9.7	45	9.0
Grade III 51-60	6	2.6	5	1.9	11	2.2
Grade IV <50	2	0.9	2	0.7	4	0.8
	233	100	267	100	500	100

$\chi^2 = 1.640$  df = 4 p < 0.802

**Table 3 :** Distribution of Morbidity of Children in Relation to their Nutritional Status.

Morbidity	Nutritional Status		Total	P value
	Normal (n=295)	Under nutrition (n=205)		
Normal	108 (36.6)	3 (1.4)	111 (22.2)	-
Dental Problems	91 (30.8)	71 (34.6)	162 (32.4)	0.428
Vitamin Deficiency	21 (7.1)	63 (30.7)	84 (16.8)	0.001
ENT Problem	11 (3.7)	34 (16.5)	45 (9)	0.001
Eye Diseases	21 (7.1)	20 (9.7)	41 (8.2)	0.373
Respiratory Infection	20 (6.7)	26 (12.6)	46 (9.2)	0.037
Gastro intestinal	15 (5.0)	21 (10.2)	36 (7.2)	0.043
Skin Diseases	26 (8.8)	29 (14.1)	55 (11)	0.084
Others	17 (5.7)	20 (9.7)	37 (7.4)	0.133

[Table 4] shows that Prevalence of anemia was 77.8% with hemoglobin less than 12 mg/dl. 21.4% were having Anemia less than 10mg/dl, majority

56.4% of boys and girls were moderately Anemic having hemoglobin in the range of 10-12 mg/dl. Anemia decreased with age.

**Table 4:** Classification Anemia According To Hemoglobin<sup>[10,11]</sup>.

Age group in year	Number	Haemoglobin					
		< 10		10-12		12 +	
		No:	%	No:	%	No:	%
6-8	105	30	28.04	86	30.45	34	30.63
9-11	240	44	41.12	94	33.33	32	28.83
12-14	180	33	30.84	102	36.17	45	40.54
Total	500	107	21.4	282	56.4	111	22.2

**DISCUSSION**

School age children form a substantial proportion of the World's population numbering about 24% of population of the Developing World and about 15% of the Industrialized World.<sup>[3]</sup> Nearly 90% of the World's children survive beyond their 5<sup>th</sup> birthday and 80% of these children are enrolled in

schools.<sup>[4]</sup> School age is a critical time in the development of human beings and the School setting provides a strategic point of entry for improving child health, self-esteem, life skills and behaviour.<sup>[5]</sup>

The finding of our study were in consistence with the study done by Rao NP, Singh D, Krishna TP in rural primary school children,<sup>[6]</sup> where the mean height of the girls was more than the boys till 13

years, after which the boys were taller than the girls. This is probably because of the early onset of puberty in girls. A similar finding has been reported from Wardha district.<sup>[3]</sup> However, at 14 years of age, the height of both girls and boys was about 10 cm more in Chandawli as compared to the children in Wardha.

In current study, it was observed that over all prevalence of malnutrition was 41%. Study done by Shakya SR, Bhandary S<sup>[7]</sup> found high prevalence of 61%, may be due to inclusion of only government school in the study. Estimates based on WHO global database suggest that 5.9% of school aged children in industrialized countries and 48% in developing countries are anaemic.<sup>[8]</sup> India continues to be one of the countries with high prevalence because of low dietary intake, poor availability of nutritious food and chronic blood loss due to hookworm infestation and malaria. NFHS-3 reveals the prevalence of anaemia to be 70-80% in children, is in par with the findings of the current study.

For the age group of 5-11 years the data on prevalence of Nutritional anaemia at all India Level or even State Level data are not available. Individual studies are available, though not adequate for any mapping on regional estimates. For the age group 6–14 years the studies are mainly school based and indicate overall prevalence of anaemia 73%.<sup>[9]</sup>

## CONCLUSION

To conclude, the nutrition status of children had barring on morbidity, and high prevalence of anemia among school children, indicates nutrition play a key role in child's life. Current supplementation of food through the school health program or Mid-Day meal program should be complimented with additional efforts like creating awareness regarding role of nutrition on overall growth and development and health of children and its impact on adulthood. This type of awareness should be in the direction of the community or parents level so that health and nutrition are sustained.

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