Assessment of Nutritional Status of School going Children (7-9 years) of East Godavari District, Andhra Pradesh

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Abstract The present study was conducted in East Godavari district, Andhra Pradesh to assess the nutritional status of 200 school going children (7-9 years). Nutritional status of children was assessed in terms of dietary Pattern, anthropometric measurement and clinical assessment of signs and symptoms of various nutrient deficiency diseases. Dietary assessment was done by 24 hour dietary recall method for three different days of 100 children. Anthropometric measurements were used to construct indices for malnutrition that were compared to reference values. The results of the study revealed that food and nutrient intake was inadequate and anthropometric measurements (mean height and weight) were significantly (P<0.05) lower than reference value. Regarding prevalence of malnutrition, it was found that only 23 percent of the boys and 17 % of girls were in normal category. There is an urgent need to educate mothers on balanced diet and preparation of low cost nutritious rich foods to improve the school children nutritional status. Beside nutrition education to the mothers, government should introduce a holistic approach by implementing various intervention programmes like Skills-based nutrition education for the family, Fortification of food items, Effective infection control, Training public healthcare workers and Deliver integrated programs.
Keywords: School children, Nutritional Status, Malnutrition

Introduction

School age is the active growing phase of childhood. Primary school age is a dynamic period of physical growth as well as of mental development of the child. Research indicates that health problems due to miserable nutritional status in primary school-age children are among the most common causes of low school enrolment, high absenteeism, early dropout and unsatisfactory classroom performance. The present scenario of health and nutritional status of the school-age children in India is very unsatisfactory. The national family health survey (NFHS) data show that 53% of children in rural areas are underweight and this varies across states. The percentage of underweight children in the country was 53.4 in 1992; it decreased to 45.8 in 1998 and rose again to 47 in 2006 (NFHS, 2007).

Growth monitoring is universally used to assess nutritional status, health and development of individual children, and also to estimate overall nutritional status and health of populations. Compared to other health assessment tools, measuring child growth is a relatively inexpensive, easy to perform and non-invasive process. Anthropometric measurements are an almost mandatory tool in any research to assess health and nutritional condition in childhood. Physical measurements like body weight, height, circumference of arm of children have been extensively used to define health and nutritional status of communities. Apart from anthropometric measurements assessing

dietary adequacy in terms of quality and quantity is equally important. Nutrition plays a vital role as inadequate nutrition during childhood may lead to malnutrition, growth retardation, reduced work capacity and poor mental and social development (Sharma and Chawla 2005). Keeping this in view the present study was undertaken to know the nutritional status of school going children as they are the building blocks of state and country.

Materials and methods: The present study was conducted on school going children in the age group 7-9 years. Total 200 rural school going children i.e. 100 boys and 100 girls were selected proportionately for the study, from the Govt. Primary Schools of Kakinada city of East Godavari district, Andhra Pradesh. Information regarding the socio-economic profile was collected with the help of questionnaire-cum-interview schedule. Food and nutrient intake of children 100 school-going children was recorded using 24 hours recall method for three different days to get accurate values. Cooked food consumed, was converted into their raw equivalents. Mean food and nutrient intake was calculated by taking mean of three days intake and compared with recommended dietary allowances (ICMR, 2008). Nutritional status of all the selected children was assessed by measuring body height (cm), weight (kg) and Mid Upper Arm Circumference which was compared with the NCHS(National Center for Health Statistics) Standards and the standards given by ICMR (Indian Council of Medical Research) (2008). Height of children was measured by a vertical measuring rod calibrated in centimeters placed on plain floor. Weighing balance calibrated in kilogram and gram was used for taking weight of respondents. MUAC was assessed by using fibre glass tape and the reading was taken to the nearest millimeter. Malnutrition was calculated as normal, mild, moderate and severe according to *Gomez classification.* (Gomez et al, 1955).

Results and discussion: Majority of selected school going children of rural and urban areas had nuclear families (83%) as compared to joint families (17%). About 89% of the children were non vegetarian and 11% were vegetarians. All most all the children were not having home food in the afternoon because of ongoing mid-day meal programme in the schools. Dietary pattern depicted that the daily mean intake of the food groups i.e. cereals, pulses, fats and oils, sugar and jaggery, milk and milk products, green leafy vegetables, other vegetables, roots and tubers and fruits, was found to be significantly ($P<0.05$ & $P<0.01$) lower than the recommended dietary intake (Table 1 & fig 1), however the intake of pulses was adequate (64.2%). Similar findings were reported by Adeladza AT (2009) who found that the diets of the children were cereals based and very low frequency of consumption of protective foods including green leafy vegetables. Regarding the intake of the nutrients (Table 2) viz. energy, fat, β-carotene, B-complex vitamins, vitamin C, iron and calcium except protein was found to be significantly ($P<0.05$) lower than the recommended dietary allowances, the lowest being iron (23.0%). The present findings can be compared with those of Handa et al, (2008). The mean height and weight of younger children (7 -< 8 years) was significantly lower than the NCHS standard value. The mean height and weight (Table 3) of older boys and girls

were significantly (P<0.05) lower than NCHS standard. A significant difference (P<0.05) was found in mean MUAC of boys and girls. This result is supported by a study Vandana Sati and Saroj Dahiya (2012) conducted on school children in age range of 6-9 years. Regarding prevalence of malnutrition, it was found that only 27 percent of the boys and 17 percent girls were in normal category. Remaining 73 percent of boys and 83 percent of girls were fall under different grades of malnutrition. It was observed that malnourishment was more prevalent among girls but boys were also affected. Similar finding were observed from earlier study done by Vandana Sati and Saroj Dahiya (2012)

Conclusion: From the above study it may be concluded that the lack of nutritional knowledge of family members may be one of the factors responsible for lower intake of food and nutrients which in turn affect the nutritional status of school going children. Hence, there is an urgent need to educate mothers of school going children about the importance of balanced diet and low cost nutritious recipes to improve the nutritional status of their children as they contribute in the well- being of the nation and the future of the nation's prosperity. Beside nutrition education to the mothers, government should introduce a holistic approach by implementing various intervention programmes like introducing

- Skills-based nutrition education for the family
- Fortification of food items
- Effective infection control
- Training public healthcare workers
- Deliver integrated programs

Table 1: Mean Food intake of School Children.

Food Stuff (g)	RDI (g)	Mean Daily Food intake	Food Adequacy (%)
Cereals	270	110.32 ± 14.47**	40.74
Pulses	70	45.36±17.58*	64.2
Fats & Oils	25	9.25 ±3.07**	36
Sugar & Jaggery	30	7.33±2.18**	23.3
Green Leafy Vegetables	100	55.14±26.40*	55
Roots & Tubers	100	42.53±23.10**	42
Other Vegetables	100	32.00±20.24**	32
Fruits	100	29.90±17.17**	29
Milk & Milk Products	500	160.92±62.10**	32

Values are mean ± SD. **Significant at 1% level. *Significant at 5% level.
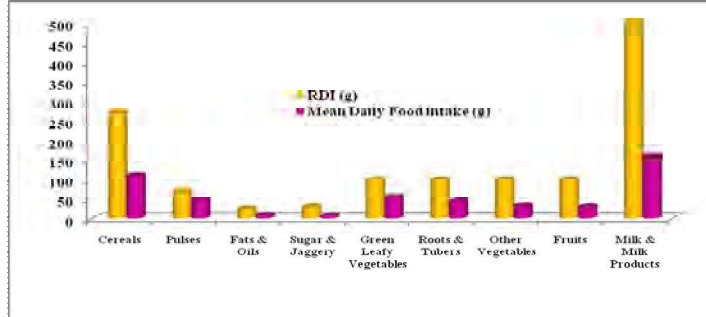
Fig 1: Mean Food Intake of School children (7-9 years)

Table 2: Mean nutrient intake of school children (7-9 years).

Nutrients	RDA	Mean Daily Nutrient Intake	Percentage adequacy (%)
Energy (K.Cal)	1950	1015.32±202.13**	52
Protein (g)	41	29.63±12.09**	70
Fat (g)	25	14.41±2.28*	56
B – Carotene (µgms)	2400	1735.4±146.21**	72
Thiamine (mg)	1.0	0.37±0.17**	37
Riboflevin (mg)	1.2	0.39±0.14**	32
Folic Acid (µgms)	60	41.48±63.21*	68
Vitamin C (mg)	40	29.98±40.33*	75
Iron (mg)	26	6.15±4.47**	23
Calcium (mg)	400	189.12±161.21**	47

Values are mean ± SD: ** Significant at 1% level : * Significant at 5% level

Fig 2: Mean Nutrient Intake of School Children
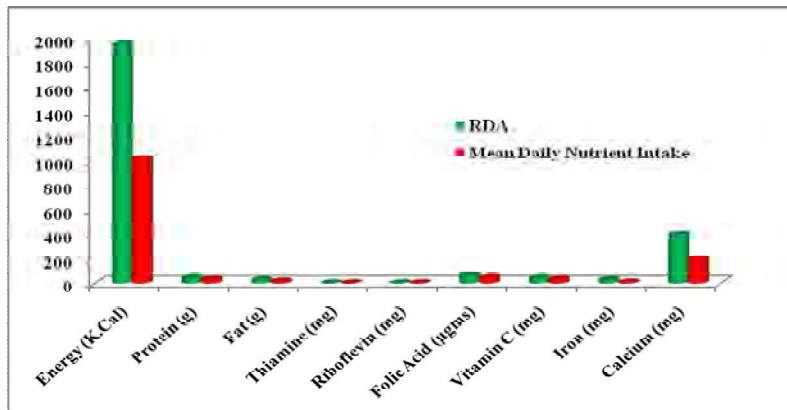
Table 3: Mean Anthropometric measurements of school children (7-9 years)

| Anthropometric Parameter	Boys (n=100)			Girls (n=100)		
	Ref. value	Observed value	% Reference value	Ref. value	Observed value	% Reference value
Height (cms)	126.98	119.20 ± 10.04*	94	126.40	101.21 ± 10.14*	80
Weight (Kgs)	25.34	16.9 ± 4.23*	67	25.00	15.254 ± 2.32*	61
MUAC (cms)	15.19	11.92 ± 1.75*	80	17.88	12.51 ± 1.08*	70

Values are Mean ± SD; *Significant at 5% level

Fig 3: Mean Anthropometric measurements of school children (7-9 years)
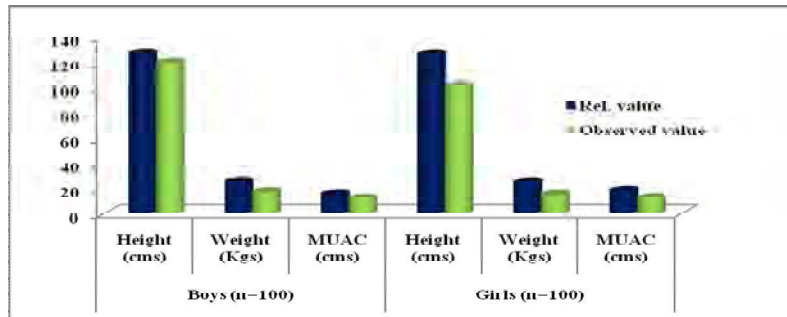
Table 4: Distribution of Scholl children as per Gomez Classification

Age (years)	Normal	Malnutrition		
		Grade I	Grade II	Grade III
7-8	21 (25.0)	45 (53.0)	12 (14.0)	7 (8.0)
8-9	8 (16.0)	25 (49.0)	7 (14.0)	11 (21.0)
9-10	15 (23.0)	20 (31.0)	16 (25.0)	13 (20.0)
Total				
Boys (n=100)	27	31	17	25
Girls (n=100)	17	59	18	6

Fig 4: Distribution of Scholl children as per Gomez Classification
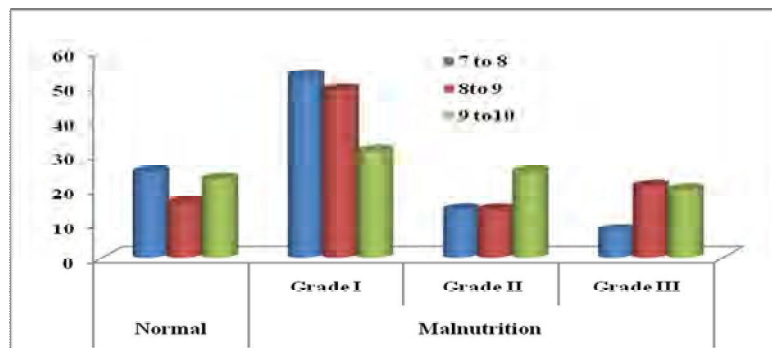
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