



Clinical Nutritional Status of Indian Girls in Deprived and Disadvantaged Communities: A Special Reference to Select Macro And Micro NUTRIENTS

**M.RAJENDRA
NATH BABU**

SENIOR RESEARCH FELLOW(UGC), DEPT OF EDUCATION, S.V.UNIVERSITY,
TIRUPATI-517502

Dr G.Nagamani

M.Sc, P.hD ,Lecturer, Dept of Home Science ,S.P.W.Degree & P.G College, Tirupati,
Chittoor, AP-517502.

ABSTRACT

To assess clinical nutritional and micronutrient status profiles, a sample of 362 girls from six rural communities (n= 120) including scheduled castes (harizan n=90) and tribes (n= 152) were examined. Heights, weights, food intakes and serum micronutrient status were assessed using standard anthropometric, diet survey and biochemical methods. Findings indicate that all the girls studied are far below the ICMR and NCHS standards for heights and weights. Rural girls are better than tribal and harizan girls. Harizan girls are worst affected. Food intakes of the girls in all the three communities are far below the ICMR Recommendations. Significantly low values are recorded for serum protein and albumin. The findings suggest that there is an urgent need for nutrition intervention and education programmes for rural and other socially deprived adolescent girls to support the growth and safe guard the mother child life cycle.

KEYWORDS : Nutritional status, Anthropometry, nutrient intake, anemia, harizan (scheduled caste), Tribal (Girizan)

Introduction:

India is a land of different castes and religions. In rural areas, most of the girls are illiterates and 4 per cent of girls between 15 to 19 years were already married. Girls between the age ranges of 10-19 years contribute to 11 percent of our total population. The adverse situation of children specially the girls in the SAARC region is largely caused by ignorance, poverty, prejudices, gender bias, cultural practices and poverty manifesting themselves in low birth weight, malnutrition, ill health, growth retardation, slow learning, low productivity, low earning capacity and unemployment. Therefore the consequences are faced by infants and the children. This picture is very grim and pathetic in deprived and disadvantaged rural, scheduled caste (harizan) and Tribal (girizan) communities. The girl infant born in these poor communities is weak, stunted and illiterate. Thus, the majority of girls in poor deprived and under privileged sections of societies suffer from anaemia, chronic energy deficiency, Protein Energy Malnutrition, Vitamin A and Calcium deficiency with poor statures. Despite the national wide focus on socially deprived communities, the studies on these deprived female populations are much limited and sparse. In view of the facts stated above, the present community based study was conducted to assess physical and clinical nutritional status of Indian girls from different socially deprived communities and also to draw comparative status profiles of girls on physical growth, nutrient intakes, clinical and serum macro and micro nutrient status parameters.

Methods

The study was conducted in the Chittoor district of Andhra Pradesh during the period of November 2000 to October 2002. From the study area following random sampling technique, the sample of 362, 10 to 18 year girls are drawn from rural areas, scheduled caste and tribal communities covering 4 different mandal areas of Chittoor district. The tribal communities covered are Sugalis, Chenchu, Irla and Enadies. The girls are distributed into three different age groups VIZ., 10-12 years, 13 to 15 years and 16 to 18 years, respectively. A group of 120 rural girls, 40 each, covering 3 age groups, 90 scheduled caste girls, 30 each in 3 age groups, 152 tribal girls i.e., 51, 51 and 50, respectively in 3 different age groups are studied. All the subjects were from low socio economic group.

Physical Anthropometry

To assess nutritional status, anthropometric data on weights and heights. Standard equipment like Detecto scales (INC. New York USA), Calibrated UNICEF, platform Beam balance was used to record weights to the nearest of 0.1 kg. Standing height was measured to the nearest of 0.5 cm using Anthropometric rod and the data was compared with heights and weights of Indian council of Medical Research and National centre for Health statistics for assessing the nutritional status of girls.

Nutrient intake

Data on the nutrient intake of each girl was collected for 3 alternate days in a week by 24 hours Recall method and one day weightment method. The raw amount of food consumed by the girl was estimated and subsequently, the nutrient intake was calculated. The intakes of Energy, protein, calcium, iron and vitamin A of each girl was calculated based on the Nutritive value of Indian foods of Indian council of Medical Research, National Institute of Nutrition (NTN) Hyderabad. And compared with recommended dietary allowances (RDA) suggested by the ICMR for different age groups were used to assess the adequacy of nutrient intakes by the study subjects.

Clinical survey

The prevalence of different nutritional deficiencies were assessed by using a clinical survey schedule designed as per the classified list of signs for various nutritional deficiencies given by Jelliffe (1966).

Biochemical Estimations

Biochemical analysis was earned out by collecting blood from the subjects and serum was used for analysis of macro (Haemoglobin, protein and Albumin), and micro nutrients (Calcium, Iron, Zinc and Vitamin A). Cyan, methaemoglobin method was employed for estimation of haemoglobin in the blood. Serum proteins and albumin were estimated by Biuret method. Immediate analysis is carried out for vitamin A estimation by using Antimony Tri chloride method based on car price reaction. Serum Zinc was assessed using standard procedure in Atomic Absorption Spectrophotometre. Dipyriddy method was followed to estimate serum iron content of the blood. Calcium was estimated by colorimetric method (Raghuramulu et al, 2003).

Results:

The present study was undertaken in 3 deprived and disadvantaged communities of Chittoor district. The period 14-18 years is a period of active growth for girls. The data in Table-1 emphasizes the Anthropometric features of girls studied from three different communities on Heights and weights and compared with ICMR and NCHS standards. 't' values were calculated for the differences on Heights and weights between the three age groups of girls coming from three different communities. All the girls from three communities are far below the ICMR as well as NCHS standards. Rural girls are better than scheduled castes and tribal girls. The scheduled caste girls are found to be inferior and weigh significantly less than that of rural and Tribal girls. The differences between the heights and weights of the girls from three communities are significant at 1 percent level (P<0.01)

Table-2 Clinical status of girls from 3 deprived communities for Micro nutrient deficiencies

Micronutrient Deficiencies	Rural (n=120)		Rural Harizan (n=90)		Tribal (152)	
	No.	%	No.	%	No.	%
Calcium	2	1.7%	12	7.5	14	21.28
Iron	85	70.7	90	100%	80	52.8
Vitamin A	18	15	36	40%	50	32.7
Zinc	36	30	50	55.6	40	23.1

Table No. 2 presents the data on clinical nutrient status of girls, the clinical survey revealed that most of the girls showed clinical signs and symptoms manifested by nutritional deficiencies such as calcium deficiency, vitamin A, Zinc deficiency and iron deficiency anemia. It is obvious that out of 362 girls, 30 girls were normal i.e., they did not show any signs of nutritional deficiencies. The least affected group showing these symptoms is 10-12 years age

group. Rural girls were better in their clinical status than compared to Tribal and Rural Harizan girls except for Iron deficiency. It is observed that all the three groups of girls had one or the other nutrient deficiencies.

Table-3 refers the mean dietary nutrient intakes of girls from 3 different communities. From the data, it was explicit that food intakes of girls in all the three communities are significantly below the ICMR recommendations. The Scheduled caste harizan and girizan girls had deficit intakes for calories, protein, Iron, calcium and vitamin A than their rural counterparts. It is observed that irrespective of the ethnicity of the family environment, both rural harizan and girizan girls are not consuming required amounts of nutrients. The percent deficits are significantly more for protein, energy, Iron, calcium and vitamin A. Among the three ethnic groups rural harizan girls are consuming very deficit intakes for all nutrients than rural and tribal girls.

TABLE - 1 : Mean Heights and Weights of Rural Indian Girls - A comparison between three deprived communities

Age (Years)	ICMR Standard	NCHS Standard	Height (cms)			ICMR Standard	NCHS Standard	Weight (kgs.)		
			Rural (n=120)	Rural Harizan (n=90)	Girizan (n=152)			Rural (n=120)	Rural Harizan (n=90)	Girizan (n=152)
10 -12	144.96	147.80	136.45**	122.62**	130.73**	37.91	39.07	32.21	19.81**	30.42***
13-15	154.82	160.70	142.2**	135.76**	139.92*	46.70	51.59	40.25**	31.72**	39.13**
16-18	155.90	163.25	150.00*	140.52**	150.60**	49.90	56.55	43.43**	39.41**	42.20***

Note: Significant at * 5% Level ** 1% Level NS-Non-significant

TABLE - 3 : Mean Nutrient Intakes of Rural Indian Girls - A Comparison between three deprived communities

Nutrients	RDA	10-12 Y			RDA	13 -15 Y			RDA	16-18 Y		
		R	RH	G		R	RH	G		R	RH	G
1. Energy (K.cal)	1970	1445.2**	1419.98**	1065.73**	2060	1620**	1581.9**	1551.87**	2060	1950.85**	1460.5**	1917.13**
2. Protein (gm)	57	31.25	28.2**	20.0**	65	42.78**	30.3**	25.60**	63	40.53**	30.6*	35.43**
3. Iron (mg)	19	16.5**	12.21**	10.59**	28	23.5**	15.34**	14.34*	30	24.5**	20.10**	15.50**
4. Calcium (g)	600	320**	250**	310**	600	390**	340**	320**	600	430**	314*	330**
5. Vitamin-A (mg)	600	41**	311**	306**	600	497**	448**	458**	600	448**	406*	405**

Note: Significant at * 5% Level ** 1% Level NS-Non-significant

In the development of any deficiency disease, biochemical changes can be expected to occur prior to clinical manifestations. From the Table-4, it is clear that all the rural Harizan and girizan girls recorded significantly very low values for hemoglobin, serum protein and Albumin. In the present study, serum protein (4.28 to 5.93 g/dl) and albumin (2.37 to 3.94 g/dl) levels were in the lower limits when compared against reference standard values given by Sauberlich et al, (1973).

All the subjects had less than 50 µg/100ml of serum Iron, while 92% of girls are suffering from anemia (Hb<9 gm/dl). Among the three communities, Tribal girls had better hemoglobin, and vitamin A levels than rural and harizan girls. Harizan girls are worst affected in all test parameters. Serum micro nutrient profile reveal significantly low levels in comparison to expected normal value for serum Iron, Zinc, Calcium and vitamin A. The range of values for serum calcium was 2.45 to 3.38 µg/ml, respectively. Similarly for Zinc i.e., 69.2 to 77.4 fag/ml, respectively.

Discussion:

The reason for the results may be due to poor dietary intakes by both harizan and girizan girls which ultimately affects the stature of the girls. Absolute increments in heights and weights of girls were also influenced by socio-economic status. More over due to culturally determined discrimination against girls, the matter of nutritional and health care is seldom. The poor dietary intake, more physical activity and poor socio economic status, girls are running with negative energy balance, which affects their physical body measurements resulting in growth retardation. Due to deficit intake of calories, protein, iron, vitamin A and calcium the girls suffer from chronic energy deficiency, Anemia, Vitamin A, calcium and other nutrient deficiencies resulting in lower biochemical concentrations in the blood. Bandari et al., (1975) studied the nutrition and health status of Indian rural girls belonging to the age group of 5-17 years. The results are far from satisfaction, meeting only 50% of standard ICMR values. Bhandari (1975) also revealed that the gains in height and

weights of well-to-do children are greater than the low socio economic group girls when compared with the NCHS standards, the increments seen in all the groups are still lower in both heights and weights.

The clinical examination is based on examination for changes, believed to be related to inadequate nutrition. The nurture of adolescent girls belonging to the age group of 10-18 years are studied by Meenakshi Mehta (1999). The results revealed that average daily energy; protein and iron consumption was 1002.4 k.cals, 34.2 gm and iron less than 10 mg respectively. Thus indicate a very low intake of energy, protein and iron of adolescent girls. In the present study also similar findings were found which reflects ultimately the nutritional status of the girls.

Conclusion:

The present study highlighted the deficit intake of nutrients by girls which possibly play a role in lower serum profiles and poor statures living in deprived communities. The findings further highlight the urgent need for nutrition intervention and education programmes for rural, harizan and girizan girls to support their growth and safeguard the, mother-child life cycle. There is also a need to add food items such as green leafy vegetables, macro and micro nutrient rich foods to the daily diet to eliminate the macro and micro nutrient deficiencies. Further, we suggest that studies should be conducted to substantiate the findings of the present study.

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