

Dietary intake of primary school children among two tribes of Meghalaya

Namita Singh, Shipra Nagar and Ranjita Devi Takhellambam

Mothers of selected primary school children of two tribes (Garo and Khasi) were personally contacted in their family and asked to provide necessary information for the researcher. The information were collected by using pre-structured deign interview schedule. Varied nutritional deficiency such as riboflavin, thiamine, Vitamin C and D and iron were observed in study subjects of both the tribes of Meghalaya. However, the study revealed that clinically there was no Vitamin A deficiency among the respondents even though the Vitamin A intake in terms of carotene is very low when compared to RDA. And there was no single case of folic acid and iodine deficiency observed among the study subject. Other than protein intake of other nutrients like energy, fat, iron, Ascorbic acid and carotene was lower than the RDA in all age group. Hence, the nutritional status of primary school children of two tribes of Meghalaya was not satisfactory.

Key Words : East Khasis, West Garo, Dietary intake, Ascorbic acid, Carotene

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INTRODUCTION

In India, the word 'Tribe' denotes a group of people living in primitive conditions (Panchbhai, 2009). The total tribal population in India is 67.6 million. The Northeastern region of India is inhabited by a number of small and large tribes and in comparison to the rest of the India this area is predominated with tribal population of upto 75%. Meghalaya is one of the seven sister states in the Northeastern part of India where 85.5 % of the population is tribal (NCHS, 1987). Khasis, Garos and

Jaintias are the three main tribes of Meghalaya (Murugkar, 2006). Dietary intake expresses the degree to which physiologic needs for nutrients are met. Knowledge of specific food patterns of primary children is important for identifying children at risk of under or over consumption of specific foods which are not balanced. Malnutrition in the primary children is a multifactorial problem involving various factors. Many factors, particularly socio-economic factors related to the living conditions, other factors related to dietary and personal habits of the primary children influence their dietary intake and hence, nutritional status. Nutritional status of children is a major public health concern as this adversely affects their physical and mental growth. Poor health and malnutrition may impair both the growth and cognitive development of primary school children. Hence, the present study was undertaken to assess the dietary intake of primary school children among two tribes of Meghalaya.

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METHODOLOGY

The present study designed is a cross-sectional and was carried out during the year 2012-2013. Tribal primary school children being 8-11 years of age from selected schools of Meghalaya have been considered for the study. The sample for the study comprised of 1399 primary school children (East Khasi tribe-702 and West Garo tribe-697) who were residing in 2 districts of Meghalaya. A well-structured interview schedule was administered to collect the details on the information regarding the individual socio-economic status and dietary pattern of the selected subjects.

For dietary intake mother, who was involved in cooking was interviewed and dietary intake of the respondent was assessed in terms of quality and quantity by 24-hour recall method. Total amount of raw ingredients cooked for whole family was recorded. The nutritional profile of the household was assessed by calculation of the energy needs of the male, the female and the children in the family, in terms of those of the average man by applying appropriate co-efficients to the different age and sex groups (Gopalan *et al.*, 2010). Standardized utensils (e.g. bowls for measuring rice, vegetables, *Dal*, milk, curd etc., spoons for measuring oil, sugar etc., dough for determining weights of chapatti) were used for measuring the approximate intake of different food items, along with this a small weighing machine was used on certain intervals in order to get more accurate results. For study subjects, dilution factor of liquid foods such as dal, tea, buttermilk etc. were also noted.

Statistical analysis :

The results of the study need to be analyzed statistically to know its significance. Appropriate statistical analysis namely per cent, mean and t-test were used to compare the data. For analysis Microsoft Excel and SPSS (Statistical packages) software programmes were mainly

used.

OBSERVATIONS AND ASSESSMENT

Income is a major yard stick for judging the socio-economic status of family or community. Most of the deprivation can be traced to inadequacy of income and wealth; adequate level of income and wealth would indicate feasibility of leading a decent life and therefore, a higher level of well-being. Lower level of these could off course lead to non-fulfillment of many of the aspirations and thus correspond to a lower level of well-being. Income earned by households would thus, apart from being an important indicator of well-being, be a proxy as well for many other aspects of well-being. A comparative analysis of the level of income earned and distribution of this among the members of the community would reveal some major aspects of the quality of life. In the present study, there exists a difference in the level of family income. Preponderance of the East Khasi tribe (31.33%) had a monthly family income between Rs. 5001/- to 10000/- whereas West Garo tribe (30.84%) had a monthly income between Rs.1000/- to 5000/- (Table 1). The reason for higher per capita income in East Khasi tribe may be that, most of the parents were undertaken business and organization services when compared to West Garo tribe.

Physiological changes associated with growing stage influence food consumption pattern and dietary nutrient intakes of children. Hence, understanding the dietary intake of the children will help in improving dietary intake and thereby nutrition status. A dietary assessment is a comprehensive evaluation of a persons food intake and nutritional status of the individual.

The present study revealed that mean intake of nutrients (Table 2) by the girls respondents of both tribes in terms of energy, fat, calcium, iron, ascorbic acid and carotene were comparatively lower in comparison with

Table 1 : Distribution of households according to income (n=1399)

Per capita monthly income (in Rs.)	East Khasi tribe (n=702)		West Garo tribe (n=697)	
	No.	%	No.	%
1000-5000	198	28.21	215	30.84
5001-10000	220	31.33	98	14.06
10001-15000	19	2.71	25	3.6
15001-20000	21	3.0	17	2.44
20001-25000	140	19.94	151	21.7
25001-50000	104	14.81	191	27.40
Total	702	100.0	697	100.0

reference standards of respective age group of RDA (Fig.1). Kasturiba *et al.* (2007) and Prakash *et al.* (2010) also reported that the mean intake of fat, iron and β -carotene of school children of age group of 8-12 years was less than the RDA.

In the present study, the reason for being recorded lower intake of nutrients is due to the non-inclusion of milk and milk product and fat in their meal pattern as tribal people prefer to have a bland diet. Similar findings was reported by Singh (2010) which indicated that the intake of milk and milk products and fat was less in the Tura. In addition, Sonkar and Pandey (2011) also reported that nutrient intake such as energy, fat, iron, calcium and vitamin C of 150 school going children (9-12 years) of Ramabai Naga, Kanpur was found to be lesser when compared to RDA. Whereas protein was comparatively more or similar with reference to RDA.

Among the boy's respondent (Table 3), the mean intake of nutrient such as energy, fat, iron, ascorbic acid and carotene were comparatively lower than RDA (Fig.

2). However, the mean fat and ascorbic acid intake is far better in the West Garo tribe when compared to East Khasi tribe. The mean protein and calcium intake is more in both tribes when compared to RDA.

Hence considering in both the gender and age (Table 2 and 3), it can be stated that the nutrient intake of West Garo tribe children is far better than the East Khasi tribe children even though the intake is less than RDA. On the contrary, Rynjah *et al.* (2009) reported that the typical Khasi meal had a balance with rice in semi and unpolished form, fermented soyabean, vegetables, such as cauliflower leaves, potatoes non-conventional seasonal fruits such as peaches, passion fruit, plums and wild berries. Non-vegetarian foods such as meat, fish and oils such as mustard and refined oils had a protective role. However, in the present study the availability of food and nutrients among the respondents in a study area is conditioned largely by various economic situations. But in the present study economic condition of East Khasi tribe is superior than West Garo tribe. So another reason

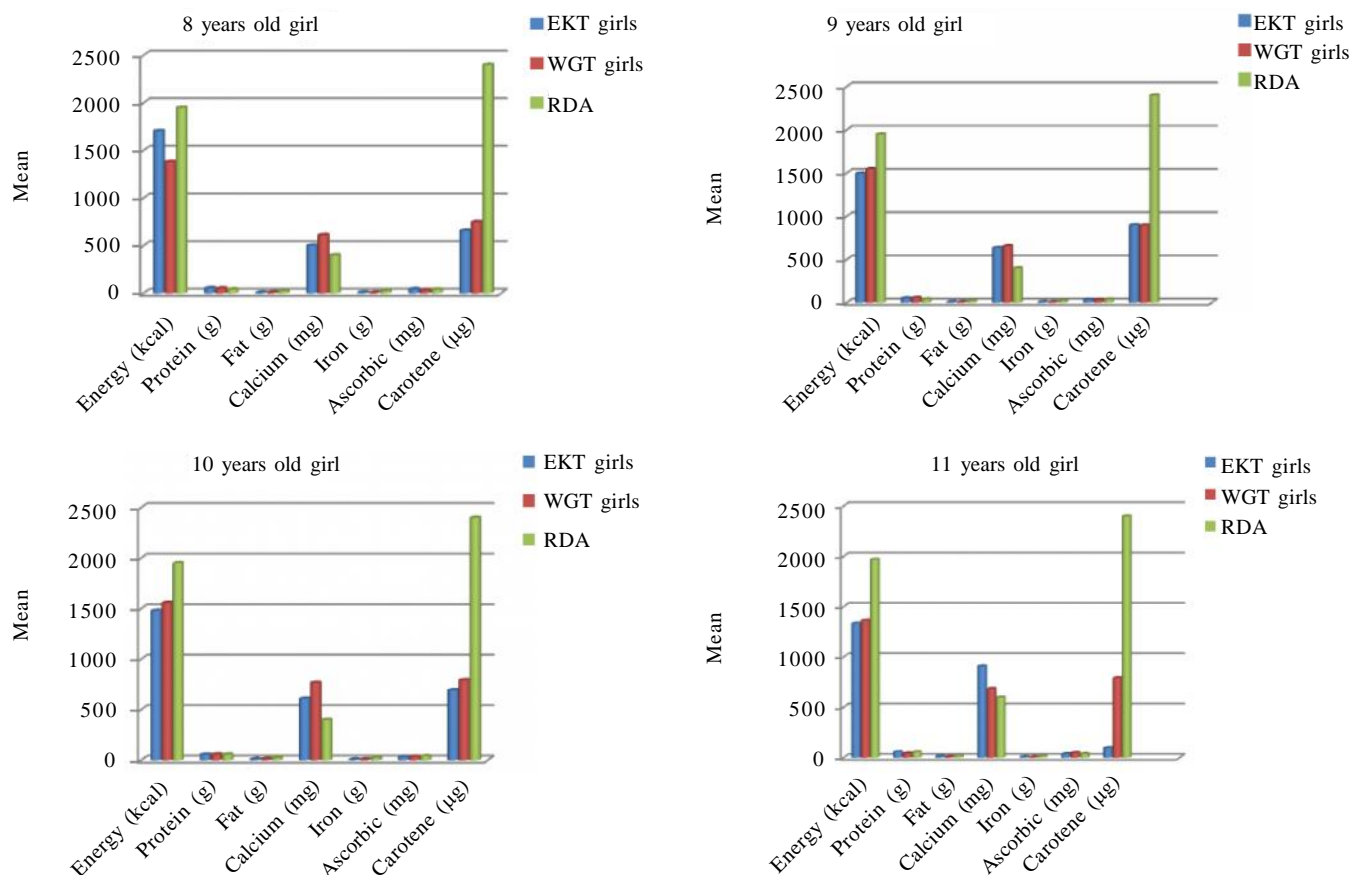


Fig. 1 : Nutrient intake comparison of the Primary girls with RDA

Table 2: Nutrient intake comparison of girls among the two tribes of Meghalaya

(n=812)

Nutrient (Mean±SD)	Districts	Age (Years)			
		8	9	10	11
Energy (kcal/day)	EKT (n=386)	1705±572.9 (1950)	1495±595.05 (1950)	1479±567.74 (1970)	1335±717.59 (1970)
	WGT (n=426)	1381±567.28	1547±651.98	1558±670.95	1365±584.17
	t-value	0.002**	0.561 ^{NS}	0.402 ^{NS}	0.780 ^{NS}
Protein (g/day)	EKT	53.78±34.44 (41)	53.14±31.99 (41)	56.46±34.95 (57)	57.68±36.52 (57)
	WGT	51.39±33.21	57.99±34.46	58.12±35.82	44.59±30.07
	t-value	0.699 ^{NS}	0.308 ^{NS}	0.755 ^{NS}	0.017*
Fat (g/day)	EKT	6.88±6.14 (25)	9.50±11.02 (25)	9.62±10.97 (25)	16.20±13.47 (22)
	WGT	9.79±10.60	9.29±11.08	11.17±10.87	10.70±11.36
	t-value	0.106 ^{NS}	0.894 ^{NS}	0.345 ^{NS}	0.007**
Calcium (mg/day)	EKT	501.61±226.26 (400)	635.46±378.56 (400)	610.28±391.15 (600)	910.61±608.82 (600)
	WGT	612.34±336.81	656.70±399.66	765.93±512.16	684.66±385.58
	t-value	0.058 ^{NS}	0.702 ^{NS}	0.027*	0.011*
Iron (g/day)	EKT	8.03±4.72 (26)	8.42±5.28 (26)	7.65±5.16 (19)	8.17±5.39 (19)
	WGT	6.84±3.19	7.85±4.07	7.67±3.91	7.72±2.85
	t-value	0.078 ^{NS}	0.375 ^{NS}	0.978 ^{NS}	0.561 ^{NS}
Ascorbic acid (mg/day)	EKT	44.19±28.72 (40)	36.71±28.94 (40)	30.53±22.91 (40)	38.59±28.78 (40)
	WGT	31.42±24.23	32.13±25.77	35.22±24.78	49.23±29.88
	t-value	0.007**	0.228 ^{NS}	0.194 ^{NS}	0.019*
Carotene (µg/day)	EKT	659.01±324.20 (2400)	899.74±638.10 (2400)	692.30±439.00 (2400)	988.15±825.82 (2400)
	WGT	749.71±525.58	895.33±649.76	792.36±454.28	791.01±779.37
	t-value	0.312 ^{NS}	0.961 ^{NS}	0.138 ^{NS}	0.120 ^{NS}

Note: Figures in parenthesis indicates estimated RDA of corresponding nutrients and the age, respectively.

EKT-East Khasi tribe, WGT-West Garo tribe. * and ** indicate significance of values at P≤0.05 and ≤0.01, respectively NS=Non-significant

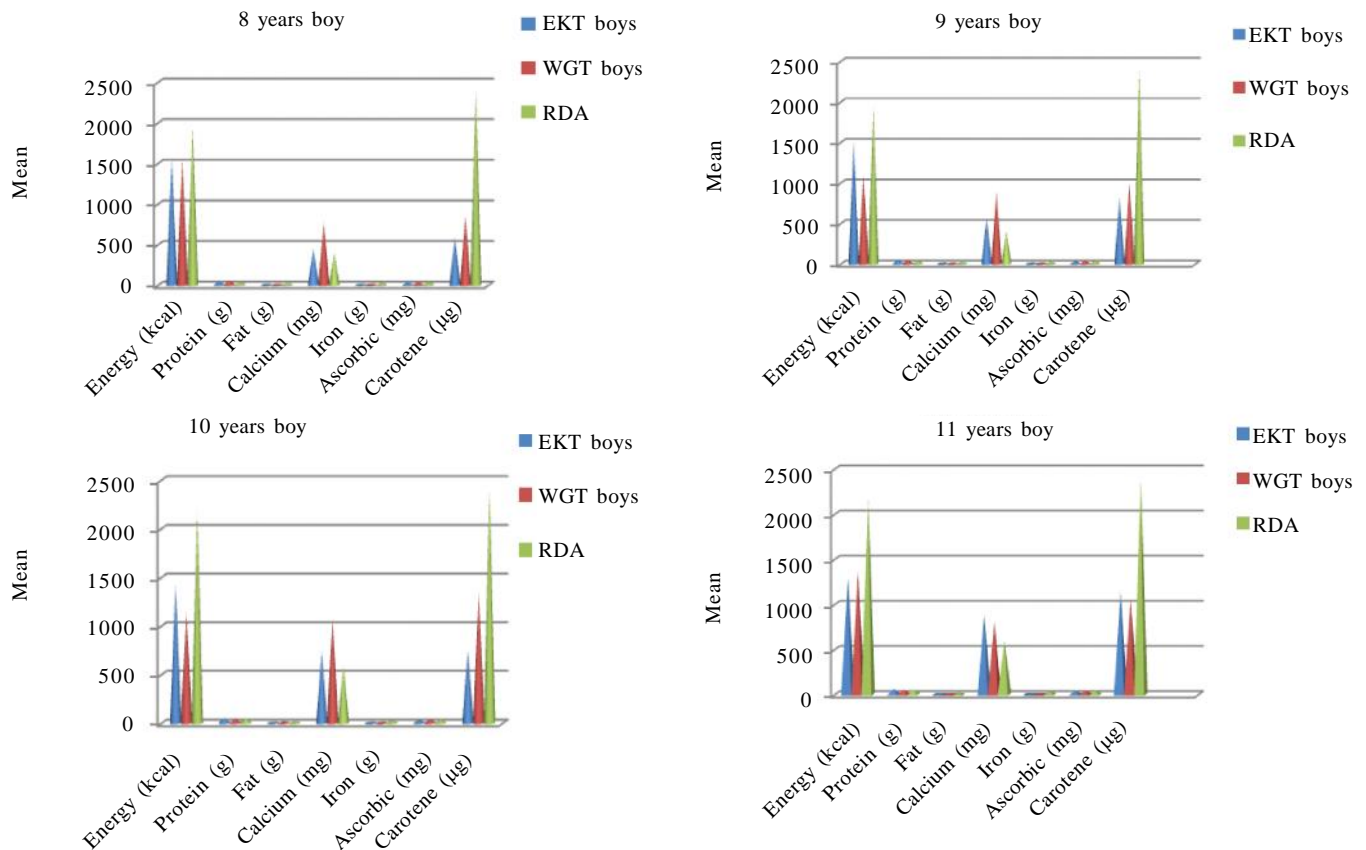


Fig. 2 : Nutrient intake comparison of the Primary boys with RDA

Table 3: Nutrient intake comparison of boys among the two tribes of Meghalaya (n=587)

Nutrient (Mean±SD)	Districts	Age (Years)			
		8	9	10	11
Energy (kcal/day)	EKT (n=316)	1559±375.91 (1950)	1522±544.62 (1950)	1421±726.00 (2190)	1295±701.19 (2190)
	WGT (n=271)	1548±729.19	1091±535.77	1142±580.19	1366±627.37
	t-value	0.925 ^{NS}	0.000**	0.032*	0.514 ^{NS}
Protein (g/day)	EKT	45.27±18.67 (41)	56.72±32.22 (41)	52.80±36.83 (54)	61.72±36.92 (54)
	WGT	59.26±37.04	51.32±35.18	46.81±35.27	54.32±31.36
	t-value	0.013*	0.351 ^{NS}	0.399 ^{NS}	0.195 ^{NS}
Fat (g/day)	EKT	5.82±4.58 (25)	8.32±10.23 (25)	12.98±13.98 (22)	16.44±13.35 (22)
	WGT	11.68±12.14	17.48±13.13	21.35±17.55	15.92±11.97
	t-value	0.001**	0.000**	0.009**	0.804 ^{NS}
Calcium (mg/day)	EKT	451.21±218.31 (400)	568.84±322.38 (400)	735.39±526.08 (600)	882.23±473.56 (600)
	WGT	554.57±56.89	892.75±487.20	1080.6±720.21	808.32±402.01
	t-value	0.000**	0.000**	0.007**	0.312 ^{NS}
Iron (g/day)	EKT	5.98±3.09 (26)	7.72±4.20 (26)	8.27±5.44 (34)	9.08±5.65 (34)
	WGT	8.07±4.36	7.34±4.28	7.73±4.12	8.84±5.04
	t-value	0.003**	0.605 ^{NS}	0.569 ^{NS}	0.787 ^{NS}
Ascorbic acid (mg/day)	EKT	32.47±22.85 (40)	33.90±26.97 (40)	33.74±24.58 (40)	36.63±26.95 (40)
	WGT	34.17±27.13	40.80±23.41	42.07±29.26	39.55±33.32
	t-value	0.706 ^{NS}	0.112 ^{NS}	0.123 ^{NS}	0.527 ^{NS}
Carotene (µg/day)	EKT	589.77±327.66 (2400)	822.83±699.71 (2400)	747.94±459.39 (2400)	1140.5±879.92 (2400)
	WGT	845.61±548.89	988.31±775.91	1344.50±1296.77	1060.70±860.14
	t-value	0.003**	0.193 ^{NS}	0.003**	0.569 ^{NS}

Note: Figures in parenthesis indicates estimated RDA of corresponding nutrients and the age, respectively.

EKT-East Khasi tribe, WGT-West Garo tribe * and ** indicate significance of values at $P \leq 0.05$ and $p \leq 0.01$, respectively NS=Non-significant

for the lower intake of nutrient among the children might be due to negligence and lack of awareness of the respondents parents especially mother who is responsible in the food preparation in terms of variety in the diet, adequacy with proper meal pattern. Sometimes ignorance on the part of parents to know the requirement of children, quantitatively or qualitatively may lead to reduce in dietary intake of children. When the child is in a hurry to go to school, he may skip breakfast or may not carry proper lunch to school or may become too tired after school activities and sleep off without taking night meals. Emotional disturbances at school due to poor academic performance or problems with siblings at home may reflect on the consumption of food (Shrilakshmi, 2011). On the contrary, Singh (2010) reported that female

population of “Garo” tribe of Meghalaya has very poor nutritional knowledge in terms of their food pattern and practices.

Conclusion :

It was observed that varied dietary deficiency such as riboflavin, thiamine, Vitamin C and D and iron were observed in both the tribes of Meghalaya primary school children. However, interesting finding in the present study is that there was no Vitamin A deficiency among the respondents even though the Vitamin A intake in terms of carotene is very low when compared to RDA. Hence on the basis of result, it may be concluded that the nutritional status of primary school children of two tribes of Meghalaya was not good because of low intake of

nutrient rich food sources. The reason is poverty, ignorance and lack of knowledge about nutrition may be the main cause of poor nutritional status of primary school children of two tribes of Meghalaya.

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