

Original Research Article

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## Assessment of Nutrient Intake of the 4-6 Years Children in Rural Area

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### ABSTRACT

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Nutrient intake of 100 rural preschool children (4-6years) in villages was studied. Dietary assessment was done by 24 hour dietary recall method for three consecutive days of 100 children. Amount of nutrients obtained per day from food consumed was calculated and compared with RDA for Indian children (ICMR, 2008). Nutrients like energy, protein, fat, Iron, calcium and B-carotene were found limiting in the diets of rural preschool children. It was also observed that the nutrient intake was higher in age group of >5-6 years as compared to age group of <4-5 years. Nutritional inadequacies, poverty, lack of infrastructure and poor education of mother lead to severe malnutrition in rural preschool children. This condition needs careful consideration. There is an urgent need to promote the importance of balanced diet and preparation of nutrient-rich recipes based on locally available food stuffs to improve their nutrient intake. Awareness programs regarding affordable but nutritious foods should be introduced by the government through community participation, involvement of non-governmental organisations and other sectors.

### Introduction

Pre-School children in India constitute about 15% of the total population. There are almost 3 to 4million suffer from severe type of malnutrition and probably 1million die because of this every year.

The majority of preschool children belonging to poor income group in developing countries suffer from various degree of growth retardation due to nutritional deprivation. An important cause of malnutrition is the ignorance of rural mothers. In

order to overcome the problem of malnutrition there is a great need for educating the rural mothers of pre-schoolers as preschool age is most significant and impression able period in an individual's life as the foundation for life time health, strength and intellectual vitality is laid during this period (Prema Ramachanran and Hema S. Gopalan, 2011).

Protein energy malnutrition is a major nutritional problem in India. It not only is an important cause of childhood morbidity and mortality but also leads to permanent impairment of physical and mental growth (Park, 2013).

Apart from that, the population of school going children contributes to future man-power which can improve the socio economic condition of developing countries. Thus their mental and physical well-being is of utmost concern which can be achieved by adequate nutrition (ICMR, 2008).

Health and nutrition are the important contributing factors for human resource development in the country. Good nutrition in the fundamental basic requirement for maintenance of positive health. A proper diet is essential for the very early stages of life, growth development and activity life (Hatinder Kaur and Tejinder Kaur, 2014; Gopalan, 2010).

Assessment of dietary inadequacy among preschool children revealed that the extend of calorie inadequacy ranged from 10 to 50 percent or more in rural areas and urban slums of the country and it has been identified to be the prime cause of under nutriton in India (Jyothi Lakshmi *et al.*, 2005)

Thus it is very important to develop good attitude towards food and food habits during this stage. Nutrition education would offer great opportunity to individuals to learn about essentials of nutrition for health and to take step to improve the quality of their diet and thus their wellbeing. Nutrition counselling is also one of the best way to educate the mother about the importance of nutrition is our daily life by educating mother about the nutritional care during pregnancy, lactation and wearing stage and the need for environmental sanitation, immunization and hygiene can greatly influence the health of children (Kaur and Kaur, 2014).

### **Materials and Methods**

A representative sample of 100 Preschool children from a total sample was randomly selected for assessment of food and nutrient intake by 24 hours recall method.

All subjects were interviewed with the help of pretested questionnaire schedule. The information regarding their dietary habits, frequency of

consumption of different food groups in a day etc. were collected. The actual food intake of the selected elderly was recalled for the immediate past 24 hours. The intake of different nutrients per day by each selected preschool children was then calculated from the food intake values using nutritive value of Indian foods (Gopalan *et al.*, 2010). Food and nutrients adequacy was calculated based on recommended dietary allowances. For this, a questionnaire was formed and each food items taken by the elderly subjects is recorded in terms of standardized cups.

### **Results and Discussion**

The average intake of nutrients by the selected rural preschool children were energy (769.235±137.615 kcal), protein (25.951±5.568gm), fat (25.569±6.510gm), iron (9.155± 3.475mg), calcium (293.260±174.477mg), B – carotene (872.403+\_528.460). In conclusion, it can be said that the intake of all nutrients by the selected rural preschool children was less than Recommended Dietary Allowances except fat, protein was found to be more than Recommended Dietary Allowances.

### **Percent Adequacy in the intake of different nutrient per day by the selected rural preschool children (N=100)**

It is evident from the result that maximum adequacy values were noticed in consumption of fat 102.27 per cent followed by protein 129.75 percent whereas B carotene recorded minimum adequacy 18.17. Even in the intake of energy and iron the percent values of adequacy were found to be 56.98 and 70.41 respectively. The adequacy values of calcium was 48.87 percent from the result it can be said that the intake of energy and calcium, iron and B carotene were found to be less but it was vice versa with regard to percent adequacy in the intake of protein and fat. In nut shell consumption of all nutrients were not satisfactory in comparison to recommended dietary allowances. Regarding the mean intake of the energy 637 Kcal (P< 0.012), Carbohydrate 123.65 gms (P< 0.023), protein 13.1

gms ( $p < 0.042$  and fat 10gms ( $p < 0.001$ ) Intake was significantly less than the recommended daily allowances (RDA). Total energy, carbohydrate, protein intake by the children which are lower than the standard. The reason for protein intake which is better than the other nutrients though less than standards may be because of the study group was staying in the coastal areas and the intake of sea food available locally was consumed. (Battalwar, 2014)

It is evident from results of nutrient intake of <4-5 years rural preschool children that adequacy value was noticed in the consumption of energy 52.26 per cent, protein 130.8, fat 105.36 per cent, iron 74.23, calcium 52.87, and b-carotene 20.00. The per cent adequacy of nutrient intake by the >5-6 years rural preschool children was found for the consumption of energy 55.92 per cent, protein 125.95, fat 96.96 per

cent, iron 64.53, calcium 42.23, and b-carotene 15.54. From the above, finding it can be inferred that per cent adequacy for the nutrient intake <4-5 years age group less than the age group of >5-6 years.

It was found that the nutrient intake of the rural preschool children age group of the <4-5 years was significantly lower than the age group of >5-6 years. The nutrients were found to be limiting nutrients in the diets of school children. There is an urgent need to promote the importance of balanced diet and preparation of nutrient-rich recipes based on locally available food stuffs to improve their nutrient intake. Awareness programs regarding affordable but nutritious foods should be introduced by the government through community participation, involvement of non-governmental organisations and other sectors.

**Table.1** Average intake of different nutrients by the selected preschool children

(N=100)

Nutrient	Mean values with SD of different nutrients intake by rural adolescent girls Mean $\pm$ SD	RDA	'Z' value
Energy (kcal)	769.235 $\pm$ 137.615	1350	42.202**
Protein (g)	25.951 $\pm$ 5.568	20	10.687**
Fat (g)	25.569 $\pm$ 6.510	25	0.874Ns
Iron (mg)	9.155 $\pm$ 3.475	13	11.067**
Calcium(mg)	293.260 $\pm$ 174.477	600	17.581**
B – carotene	872.403 $\pm$ 528.460	4800	74.322**

RDA = Recommended Dietary Allowances

\*Significant at 0.05% level

\*\*Significant at 0.01 % level

NS Non -Significant

**Table.2** Adequacy in the intake of different nutrients per day by the rural preschool children.

(N= 100)

Nutrient	RDA	Mean intake $\pm$ SD	percent adequacy
Energy (kcal)	1350	769.235 $\pm$ 137.615	56.980
Protein (g)	20	25.951 $\pm$ 5.568	129.753
Fat (g)	25	25.569 $\pm$ 6.510	102.276
Iron (mg)	13	9.155 $\pm$ 3.475	70.419
Calcium(mg)	600	293.260 $\pm$ 174.477	48.877
Folic acid ( $\mu$ g)	40	17.850 $\pm$ 4.383	44.626
B – carotene	4800	872.403 $\pm$ 528.460	18.175

RDA = Recommended Dietary Allowances

**Table.3** Per cent adequacy of different nutrients intake per day by the rural preschool children as per age (N=100)

Nutrients	<4-5years (51)			>5-6years (49)		
	Mean ±SD	RDA	% adequacy	Mean ±SD	RDA	% adequacy
Energy (kcal)	773.11± 159.92	1350	52.26	755.05±106.54	1350	55.92
Protein(gm)	26.16± 6.14	20	130.8	25.19± 4.88	20	125.95
Fat(gm)	26.34± 7.50	25	105.36	24.24± 5.05	25	96.96
Calcium(mg)	317.77± 186.93	600	52.87	253.38± 154.13	600	42.23
Iron (mg)	9.65± 3.49	13	74.23	8.39± 3.36	13	64.53
B-carotene(ug)	960.41± 514.35	4800	20.00	746.65± 518.22	4800	15.54

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