

# Prevalence of Undernutrition and Poor Health Status in School going Children (7-12 Years) in Sankarankovil, Tirunelveli District, Tamilnadu

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## ABSTRACT

Objective: Under nutrition in school children is one of the major problems in developing countries especially in India. The Government has introduced such programs like Mid-day-Meal program to overcome under nutrition. The present study was conducted in Government aided middle schools in rural area of Sankarankovil, Tirunelveli district.

Methods: The subjects around 200 were randomly selected and the detailed information was collected regarding socioeconomic status; nutritional status includes anthropometry, clinical and dietary pattern by direct interview method and data was statistically analyzed.

Results: The results revealed that most of the children belong to a low income family group; anthropometry measurements suggest that children had significantly lower mean values compared to the standard, though it revealed the school children were undernourished. Dietary pattern and consumption of iron intake was also found to be very low.

Conclusion: Nutritional status has to be improved by dietary modification, iron supplementation and nutrition knowledge.

Keywords: Nutritional Anemic, dietary pattern, prevalence, children.

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## 1. INTRODUCTION

Malnutrition continues to be a primary cause of ill health and mortality among children in developing countries. It is a major public health problem and account for about half of child deaths worldwide (UNICEF, 2004). Despite of the rapid progress that has been made in the technology of food production and processing, global malnutrition continues to be a major area of concern for public health. India, being a country in developmental transition, faces the dual burden of pre-transition diseases as well as post-transition, lifestyle-related degenerative diseases such as obesity, diabetes, hypertension, cardiovascular diseases and cancers. According to the recent reports of National Family Health Survey (NFHS, 2007) and (UNICEF, 2007), nearly five percent of preschool children and 30 percent of adults in India suffer from moderate and severe grades of protein-calorie malnutrition as judged by anthropometric indicators. Currently, India is in nutrition transition to 10 percent rural, 20 percent urban population suffering from over nutrition, leading to an emerging double burden of malnutrition (Gopalan, 2008).

According to ICMR (2010) the widespread malnutrition is largely as a result of dietary inadequacy and unhealthy lifestyles. Other contributing factors are poor purchasing power, faulty feeding habits, large family size, frequent infection, poor health care, inadequate sanitation and low agricultural production. Health and nutritional status of children of school age are neglected by nutritionists and policy makers because of the reduced acceleration of growth observed during this age range. Many forget that these children are also at risk of nutritional problems owing to increased energy expenditure combined with decreased meal frequency, reduced maternal attention and parasitic infestation. Hence, care should be given to improve their health status. Since, this period precedes the period of adolescence, which is marked by very rapid growth; it is important that a good nutritional foundation is laid during this period of school age and also prevent the occurrence of deficiency diseases. By keeping all these points in mind, an attempt has been made to conduct the present study framed the objective as to assess the nutritional status among the school going children in rural areas of Tirunelveli district.

## 2. MATERIALS AND METHODS

Childhood is the critical period, which needs extra nutritional care to promote and maintain their health and nutritional status and also preventing many macro and micro nutritional deficiency diseases among children especially girls. The study was done at Government aided middle school in a rural area located at Sankarankovil, Tirunelveli District, Tamil Nadu through proper channel. An interview schedule was formulated to collect information regarding socioeconomic status of the family, age, occupation and income status of the family, nutritional assessment were recorded and compared with National Center for Health Statistic (NCHS) standard. Clinical examinations were recorded and the dietary pattern such as dietary habits, Nutrient intake

was calculated by using 24 hour recall method for three days working and 1 day non working (72 hours recall method) and frequency consumption of iron rich foods was collected. The procedures used in this study were approved by the Research Ethics Committee for Nutrition Departments of PSG College of Arts and Science, Coimbatore. Besides, the data about menarche status includes age of menarche, the problem facing during menstruation was also gathered. All the data were analyzed and interpreted using SPSS software version 17.0.

### 3. RESULT AND DISCUSSION

#### 3.1. General characteristics

##### 3.1.1. Age group

A total of 200 school going children were belongs to females were participated in the present study. The age was ranged from 7-12 years. About 9.5 percent of the girls belonged to 7 years followed by 13, 16.5, 18.5, 17.5 and 25 percent of girls in the age of 8, 9, 10, 11 and 12 years respectively.

##### 3.1.2. Type and size of the families

It was noted that 81 percent of the families of the selected subjects belonged to nuclear family system and 19 percent of the families of them belonged to joint family system. The majority 52 percent of the families selected for the study had one to three family members, 43 percent had three to six members in their families. Sixty five percent of the families belonged to the religion of Hindu, 11 percent of them were Christian and 24 percent of the families were Muslims.

##### 3.1.3. Educational status of the parents

Out of 200 school children, 47 percent of parents of the selected subjects were educated and had education at various level of schools and colleges. From the gathered data, it is cleared that 30 percent had education upto primary school level, 45 percent had middle school level education, 12 percent had higher school level and 12 percent had college level education. Among them 53 percent of the parents were illiterates.

##### 3.1.4. Occupational and economic status of the family

Occupational status is the important determinant to reflect the economic status of the family. An occupation analysis of the subjects fathers revealed that 56 percent farmer, 35 percent were coolies, five percent were auto drivers and eight percent were shop keepers. In case of mothers 70 percent were housewives and rest of 30 percent were formers and coolies. According to HUDCO income classification (2007), majority of the subjects (65%) were belongs to middle income group and 21 percent were low income group. Only 14 percent of the families are earning above Rs. 7500 as high income criteria. Thus it revealed socio economic status and education might be the reason for unawares of nutritious food intake.

#### 3.2. Anthropometric measurements

The anthropometric measurements of average height and weight of the subjects are given in Table I. Mean height of the selected subjects was ranged from 114.1 cm to 130.6 which was found to be significantly lower than as per age group of NCHS standard (2008). The mean weight of the selected subjects was varied from 13.3 kg to 16.6 kg found to be lower than the NCHS standard value. Thus, the result can be inferred that mean height and weight of all age groups was lower than the reference range. From the height and weight data, Body Mass Index (BMI) was calculated; all the subjects were underweight when compared to the WHO (2006) standards.

**TABLE I**  
**MEAN HEIGHT AND WEIGHT OF THE SELECTED SUBJECTS**

AGE (YEARS)	N =200	HEIGHT (cm)			WEIGHT (kg)		
		NCHS	MEAN	DIFFERENCE	NCHS	MEAN	DIFFERENCE
7	19	120.6	114.1	-6.5	22.2	13.3	-8.9
8	26	127.4	114.6	-12.8	26.3	14.3	-12
9	33	133.2	117.2	-16	30.8	13.4	-17.4
10	37	138.5	121.8	-16.7	32.6	15.1	-17.5
11	35	144	130.6	-13.4	37.6	14.5	-23.1
12	50	151.5	129.7	-21.8	41.5	16.6	-24.9

### 3.3. Clinical examination

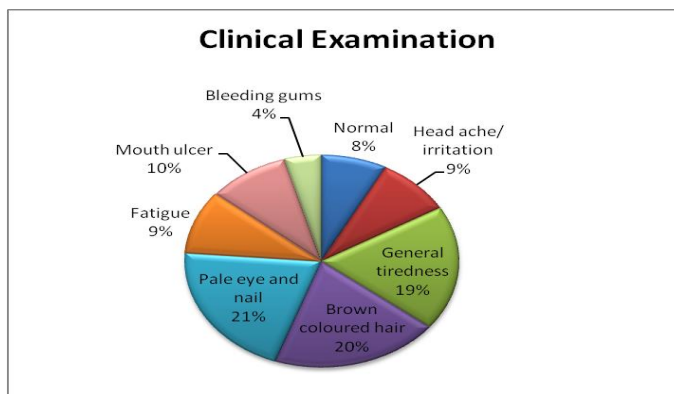


Figure 1. Percentage of clinical signs and symptoms identified from the subjects

From the study group, the prevalence of signs and symptoms of nutritional deficiencies were observed. Percentage of prevalence of lack of interest, tiredness, bleeding gums, fatigue etc was observed among the subjects of the study groups and presented as in figure 1. About 8 percent of the subjects are being normal; the other 92 percent of the children were noticed to be having clinical signs and symptoms which indicates the nutritional deficiency.

### 3.4. Dietary pattern

#### 3.4.1. Dietary habits

According to Moreno *et al.*, (2010), scientific evidence is increasing about the dietary factors associated with this relationship, exclusively a low meal frequency, skipping breakfast, and a high consumption of sugar sweetened beverages. In the present study, the total subjects, sixty percent of the subjects were non vegetarian. The frequency consumption of non vegetarian foods was low (60 %), due to their low economic status. Out of 200 subjects 122 subjects skipped their one or other part of the meals. The data showed that, 60 percent of the subjects skipped their breakfast, and nine percent of the subjects skipped their lunch and 31 percent of the subjects skipped their dinner regularly. Eating disorders like anorexia nervosa (12 percent), binge eating (54 percent) and bulimia nervosa (34 percent) were present among subjects.

Nearly 75 percent of the subjects did not have the fruits in their routine diet and their health status is affected and chance of getting nutritional deficiency diseases, since fruits are very good source of several vitamins, mineral salts and dietary fibre, all of which are essential for good health. The reason for not consuming fruits in their diet was mainly due to cost of the fruit or non availability of fruits in their families. About 5 percent of the subjects were found to be regular intake of milk and curd it because of they have own cattle farm and 56 percent subject were had black coffee in morning and evening. Only thirty nine percent of them were not practiced with coffee or tea.

#### 3.4.2. 24 hours recall method

Seven two hours dietary recall method was conducted for the subjects to find out the adequacy of the diets in terms of nutrient requirement. Average daily intake of the subjects in the study groups was compared with RDA suggested by ICMR (2010).

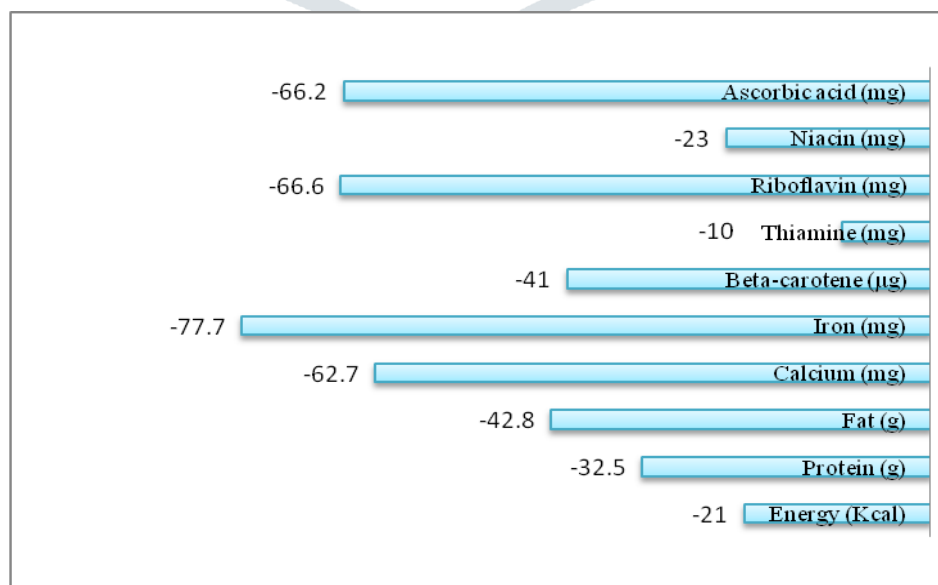


Figure 2. Percentage deficit and excess of nutrients compared with RDA

From the data of the mean intake of the nutrients for the study group was very low and deficit. The mean intake of the energy is 1576 kcal of the study group; it was very low when compared to ICMR – RDA (2010). The mean intakes of protein, fat, calcium, iron, beta carotene are deficit when compared to ICMR - RDA 2010. Although it reveals clearly that the intake of food items listed in table 3 was low while comparing with the standard.

### 3.4.3. Frequency Consumption of Iron Rich Foods

The majority of the subjects is occasionally consumed iron rich foods. Poor consumption of iron rich food is highly responsible for the occurrence nutritional anemia. Eating poor quality of iron rich foods was the other main reason for the occurrence of iron deficiency anemia. The consumption of iron rich foods by the selected subjects was collected and given in the Table III. The majority of the subjects consumed iron rich foods occasionally. Poor consumption of iron rich food is highly responsible for the occurrence nutritional anemia. Eating poor quality of iron rich foods was the other main reason for the occurrence of iron deficiency anemia.

**TABLE II FREQUENCY CONSUMPTION OF IRON RICH FOODS**

IRON RICH FOODS	DAILY		WEEKLY		MONTHLY		OCCASIONALLY	
	N	%	N	%	N	%	N	%
Rice flakes	-	-	-	-	156	78	44	22
Roasted Bengal gram	52	26	79	39	40	20	29	15
Soybean	-	-	-	-	26	13	174	87
Drumstick leaves	-	-	123	62	60	30	17	21
Curry leaves	189	95	11	5	-	-	-	-
Bitter gourd	-	-	56	28	79	40	65	32
Sundakai	-	-	-	-	56	28	144	72
Dried fruits	-	-	-	-	155	77	45	23
Dates	30	15	95	48	75	37	-	-
Egg	40	20	130	65	30	15	-	-
Liver	-	-	48	24	120	60	32	16

## 4. Menarche status

Menarche, the first menstrual period, is a critical biomarker in the reproductive life of females stated by Sloboda *et al.*, 2007 and Thomas *et al.*, 2001. It has also been associated with the metabolic syndrome (Frontini *et al.*, 2003) and overweight (Adair *et al.*, 2001; Wettigney *et al.*, 1999). Ultimately, it also poses a public health concern as it may perhaps result in earlier onset of sexual activity. Depression, eating disorders and poor school performance are among the other teenage problems that have been associated with early menarche. About 63 percent subjects attained their menarche at their age of 10-12 years among 200 subjects. Rest of the subjects did not attain their menarche, at the time of study period. Among the 63 percent of subjects, 79 percent of children having menstrual problems like excessive bleeding, stomach pain, irregular periods and back pain. These problems might be due to not only iron deficiency but also nutrient lack in their daily intake. Nearly 21 percent of the subjects did not suffer from the menstrual problems.

### Conclusion

The present study concludes that school children belongs to 7-12 years from rural areas their socio economic status were low and their nutrient intake was found to be low while compared to RDA. Thus it reveals that there is relationship between the socio economic status and dietary pattern. A step has to be taken to improve the nutritional status through diet modification and awareness of nutritional knowledge. Good nutrition is essential for school-age children. Targeting animal products to those with highest iron content and supporting the production of small animals and fish, would increase the intake of absorbable iron and other micronutrients.

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