A Study On Nutrition And Health Status Of School Going Children Belonging To Different Socio Economic Status

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Abstract:

It is a well established fact that improper eating habits increase risks for a number of immediate health problems such as anemia, under nutrition/ obesity and bone health in children. Dietary practices during school age may also have long term implications on the development of chronic diseases. The objective of the study was to investigate the Health status and its relation with nutrition of school children. Anthropometric status, dietary status, clinical and health status was recorded. Height and weight of both groups was lower than the NCHS standards whereas, mid upper arm circumference and triceps were adequate to the standards. Children were deficit in nutrient intake like energy, protein, fat, iron and calcium in both groups. Children exhibited high presence of clinical symptoms and infections. . It is concluded that poor anthropometric indices, low dietary intake influence on the clinical and health status of school children

Key words : Malnutrition, Anthropometric measurements, Health, Morbidly, Dietary habit.

1.Introduction

School age period is nutritionally significant. This period is quite vulnerable and considered to be special risk group. Malnutrition during this period can interfere with school performances; impair body function, working ability and physical growth. Hence, adequate food is important requisite for growth and development. (Swaminathan et al., 2007; Premnath et al., 2010).Nutritional needs of the 11- 15 years Children are higher because of the growth spurt, sexual maturation, changes in body composition, skeletal mineralization and changes in physical activity. NNMB (2000). Over the last three decades, eating habits/ pattern and physical activity levels of children have also changed. The availability of high fat foods, the changed social environments associated with some non nutritional foods, the changed social environments associated to the increased incidences of obesity and possibly micronutrient deficiencies. Hence, like many developing countries, India is also facing an increasing burden of malnutrition, due to poverty and affluence. (Choudhary et al, 2009).In this back drop a study was conducted on effect of nutrition and dietary pattern of school children belonging to different socio economic status with the following objectives

- To study the variations in nutritional status of children in relation to their age group, gender, socio economic status
- To study the dietary habits and assessment of the adequacy of dietary intake of Children from different socio economic conditions. .
- To investigate the health problems of school going children in terms of common ailments and biochemical analysis.

2.Materials And Methods

The study covered a random population of 720 school going children located in 5 schools in Bangalore city. Two corporation schools consisted of low income group children, two private schools with fee structure of Rs. 500 - 750/month consisted of middle income group and one affluent private school with fee structure of 1000 – 1500/month were randomly selected. The selection of the children was based on the family income (family income was collected from school records) and age.

Seven hundred school children were further divided them in to three groups based on their family income. Each group consisted of 240 children (120 boys and 120 girls) belonging to 11^+ to 14^+ years of age group.

A detailed questionnaire schedule was developed to elicit information on Socio economic status, Dietary pattern using 24 hour recall method, Health and morbidity status, anthropometric measurements such as Height, weight, MUAC and triceps and nutritional knowledge were assessed using structured questionnaire. A sub sample of 20 per cent of total sample was selected from all the three groups were subjected to hemoglobin estimation using cyanmethemoglobin method.

Data on socio-economic status included Type of family, educational classification of the parents, occupation of parents and monthly family income. Anthropometric status was assessed by height, weight, mid upper arm circumference and triceps skin fold measurements.

3.Result And Discussion

Dietary pattern of the subject showed that most of the children were non vegetarians irrespective of gender and income and most of them had three meals a day pattern.

Mean intake of different foods by the subjects was derived from 24 hour dietary recall method. Significant difference was observed between the group, gender and age for all food stuffs except energy. The percent adequacy of food stuffs was much lower in green leafy vegetables and fruits. By and large, except for cereals and sugar and Jaggery, the intake of all the food groups was lower than the desirable dietary pattern irrespective of age group, gender and socio economic status. Consumption of fats and oils by middle and high income group was more when compared to low income group and it was statistically significant in the age group of 11 -13 years boys.

The nutrient intake pattern indicated a decreased trend over the age group of 11- 15 years. The older children of different income group and sex tend to reduce the intake of all the nutrients except fat and energy. The results indicated that all the groups were deficit in all the nutrients except energy and Protein when compared to RDI. Consumption of fat was more in high income group. It was surprising to note that consumption of protein was on par or some time more than RDI. But most of the protein was supplied by the cereal and was incomplete qualitatively since consumption of pulses was comparatively less. The inadequate intake of food had influence on the nutrient intake of both groups.

Nutrients	11 – 13 Years				F Value	13 m- 15 Years				F Value
	RDA°	LI	MI	HI		RDA°	LI	MI	HI	
		Mean (± SD)					Mean (± SD)			
Energy (Kcal)	2010	1552	1923	2115	3.41*	2330	1976	2087	2115	1.23 NS
Protein (g)	40.4	40.34	48.47	56.26	6.05**	51.9	48.95	53.75	56.26	5.98**
Carbohydrate (g)	-	215.0	289.09	305.45	7.64**	-	293.45	328.01	305.45	2.30 NS
Fat (g)	35	21.48	32.59	38.81	2.72 NS	40	21.19	30.23	36.23	2.72 NS
Calcium (mg)	800	576.73	675.39	713.65	1.35 NS	800	586.44	603.54	703.33	6.46**
Iron (mg)	27	15.98	16.03	17.65	0.01 NS	27	17.07	17.39	18.67	0.01 NS
Retinol (µg)	600	542.52	557.24	571.90	0.02 NS	600	575.25	554.03	68.10	0.01 NS
Ascorbic Acid (mg)	40	38.07	38.24	37.43	0.80 NS	40	36.71	36.82	37.95	0.13 NS
Thiamine (mg)	1.0	0.97	1.04	1.18	0.32 NS	1.2	0.99	1.00	1.01	0.87 NS
Riboflavin (mg)	1.2	1.14	1.09	1.06	0.71 NS	1.4	1.19	1.09	1.16	0.01 NS
Niacin (mg)	13	10.23	11.00	11.25	0.04 NS	14	11.31	11.60	12.48	0.08 NS

Table 1: Mean nutrient intake Girls Belonging to different to Different Income Groups

° RDA: (2010)   * - Significant at 5 % level   ** - Significant at 1% Level   NS - Non Significant

Nutrients	11 – 13 Years				F Value	13 m- 15 Years				F Value
	RDA°	LI	MI	HI		RDA°	LI	MI	HI	
		Mean (± SD)					Mean (± SD)			
Energy (Kcal)	2190	1652	1936	2114	**2.41**[NS]	2750	2056	2314	2589	**6.20**[**]
Protein (g)	39.9	40.34	51.11	55.89	**1.21**[NS]	54.30	51.71	59.51	68.61	**1.40**[NS]
Carbohydrate (g)	-	259.77	296.32	314.72	**1.40**[NS]	-	329.39	346.41	383.43	**1.50**[NS]
Fat (g)	35	31.95	40.08	64.82	**6.80**[**]	45	36.89	64.81	74.61	**6.80**[**]
Calcium (mg)	800	566.53	582.70	612.43	**1.20**[NS]	800	584.92	621.50	672.50	**2.60**[NS]
Iron (mg)	21	13.19	14.35	16.27	**1.90**[NS]	32	17.11	21.87	22.52	**1.60**[NS]
Retinol (µg)	600	559.49	562.00	582.68	**0.02**[NS]	600	571.31	579.67	586.72	**0.01**[NS]
Ascorbic Acid (mg)	40	37.24	37.45	38.63	**0.01**[NS]	40	36.41	37.02	37.16	**0.49**[NS]
Thiamine (mg)	1.1	1.01	1.22	1.12	**0.18**[NS]	1.4	1.10	1.22	1.21	**0.02**[NS]
Riboflavin (mg)	1.3	1.13	1.17	1.23	**0.05**[NS]	1.6	1.23	1.38	1.40	**2.80**[NS]
Niacin (mg)	13	11.93	12.55	13.68	**1.40**[NS]	16	12.70	13.32	14.28	**2.70**[NS]

Table: 2 Mean nutrient intake Boys Belonging to different to Different Income Groups

° *RDA: (2010)*   ** - Significant at 5 % level*   *** - Significant at 1% Level*   *NS - Non Significant*

Somatic status of the study group showed an increment with increasing years over the age gradient of 11-15 years in both the groups. It was found from the results that, height, weight, MUAC (Mid upper arm circumference) and triceps of low income group children were lower than the standard and also from their counterparts of middle and high income. The difference between the groups was insignificant but it was significant between the age groups. Most of the children in the group, sex and age fell between the 50th – 75th percentiles in height and weight.

The results of the somatic status based on BMI, Broka`s Index (BI) and Lean Body Mass Index (LBMI) indicated that Most of the boys were well nourished. More Number of boys from lower income group was under weight when compared to other two groups. According to Broka`s Index prevalence of under nutrition in the low and middle income girls was found to be more than high income group children. More number of children from high income group was obese and was significant between the groups. The same results were found by Swaminathan and Premnath. LBMI results showed that more e than 70 per cent children from all groups were chronically energy deficit which was confirmed by the low intake energy compared to RDA.

The results of clinical examination of boys and girls indicated significant difference between the three groups. More number of boys had breathlessness where as more number of girls were suffering from fatigue, breathlessness, giddiness, and infections. This may be due to physical change that happens due to menarche. More number of expressed of suffering from stomachache, head ache, pain in legs and arms. The morbidity status of the girls showed significant difference between the groups.

Results of biochemical analysis of blood for hemoglobin indicated that, more percentage of children from all the group were mild anemic. More number of girls from low income group was moderately anemic as compared with other groups. It was found that very less percent from both the groups were found to be normal. The prevalence of moderate and mild anemia among adolescent girls based on the data of 16 districts of country was 50.9 and 32.1 per cent respectively (ICMR, 2001). Similar trend was observed among the low income group.

Anthropometric Measurements	Age (Years)	Respondents								
		Low Income			Middle Income			High Income		
		N	Mean	SD	N	Mean	SD	N	Mean	SD
Height (cm)	11 -13	61	143.55	6.16	58	143.74	8.72	63	146.90	6.35
	13 - 15	59	152.46	4.50	62	153.33	7.08	57	156.78	8.14
Weight (kg)	11 -13	61	34.30	6.14	58	35.57	8.88	63	41.37	7.58
	13 - 15	59	43.65	6.62	62	44.11	7.71	57	47.37	7.62
BMI	11 -13	61	16.63	2.67	58	17.07	3.28	63	19.24	3.75
	13 - 15	59	18.81	2.99	62	18.82	3.38	57	20.63	4.61
MUAC (cm)	11 -13	61	16.07	2.46	58	17.21	4.85	63	18.06	3.16
	13 - 15	59	18.53	3.35	62	20.66	5.37	57	20.57	3.86
Triceps (mm)	11 -13	61	8.07	1.31	58	8.58	1.36	63	10.28	1.34
	13 - 15	59	8.45	1.14	62	9.21	1.45	57	10.36	1.48
MUAMC	11 - 13	61	13.53	2.35	58	14.37	4.87	63	15.20	3.23
	13 - 15	59	15.87	3.50	62	17.77	5.43	57	17.50	3.79

Table 3: Mean ± SD Anthropometric Measurements of Girls by their Income Status

Anthropometric Measurements	Age (Years)	Respondents								
		Low Income			Middle Income				High Income	
		N	Mean	SD	N	Mean	SD	N	Mean	SD
Height (cm)	11 -13	59	144.25	5.85	60	145.41	6.75	56	144.58	7.47
	13 - 15	61	154.38	4.72	60	155.2	5.25	64	156.83	7.86
Weight (kg)	11 -13	59	34.08	7.25	60	35.05	6.63	56	34.45	8.12
	13 - 15	61	46.20	7.78	60	47.10	9.17	64	49.63	9.22
BMI	11 - 13	59	16.43	3.55	60	16.62	3.16	56	16.91	3.36
	13 - 15	61	19.37	3.12	60	19.55	3.69	64	20.1	2.99
MUAC (cm)	11 -13	59	16.36	2.78	60	17.87	4.19	56	18.12	4.57
	13 - 15	61	19.99	1.84	60	20.21	2.49	64	20.49	3.35
Triceps (mm)	11 -13	59	7.64	4.54	60	8.89	6.09	56	10.04	1.41
	13 - 15	61	8.06	5.88	60	10.33	7.02	64	9.67	2.31
MUAMC (cm)	11 - 13	59	13.92	3.07	60	15.24	4.17	56	14.96	4.60
	13 -15	61	17.46	2.41	60	18.10	2.60	64	17.45	3.48

Table 4: Mean ± SD Anthropometric Measurements of Boys by their Income Status

With greater emphasis on the health of the women in general and the girl child in particular in the millennium, the picture of iron deficiency anemia seen in the girls is alarming though not surprising. With the poor quality of diet consumed from childhood and the onset of menarche seen as secular tread in the population, depletion of iron stores would occur at faster rate in this group. In the current study, more children exhibited mild to moderate type of anemia, while no one found to be severely anaemic. This may be due to supplementation of iron and folic acid tablets in corporation schools through Government distribution thus improved the level of hemoglobin.

Clinical Examination	Observed *								χ^2 value
	Boys				Girls				
	LI	MI	HI		LI	MI	HI		
	N (%)	N (%)	N (%)	Total	N (%)	N (%)	N (%)	Total	
Spongy bleeding	14	11	4	**29**	6	4	7	**17**	
Dental caries	11	8	13	**32**	9	8	10	**27**	
Fatigue	12	15	16	**43**	48	37	16	**101**	
Brittle Nails	4	1	-	**5**	5	-	-	**5**	
Breathlessness	19	24	8	**51**	30	20	10	**60**	
Giddiness	12	10	6	**28**	24	18	8	**50**	**29.08**[**]
Frequent infections	21	17	11	**49**	24	6	10	**40**	
Dry and scaly skin	2	4	2	**8**	1	1	-	**2**	
Angular Stomatitis	12	8	7	**27**	4	11	2	**17**	
Tongue Red and Raw	14	7	4	**25**	8	16	8	**32**	
Cheilosis	9	6	7	**22**	3	3	2	**8**	

Table 6: Clinical symptoms of the Respondents

[**] *Significant at 5% level*

Common Ailments	Respondents*			χ^2 Value
	Boys	**Girls**	**Total**	
	N (%)	**N (%)**	**N (%)**	
Cold	48	125	173	
Cough	52	111	163	
Fever	34	100	134	
Diarrhoea	31	26	57	
Vomiting	18	36	54	
Stomach ache	27	122	149	
Acidity	16	16	32	
Constipation	39	42	81	**90.71****
Back ache	17	64	81	
Head ache	57	164	221	
Pain in legs and arms	24	150	174	
Fatigue	22	68	90	
Throat pain	15	11	26	
Tooth pain	12	15	27	
Eye strain	1	10	11	

Table 7: Morbidity Status of School Children
*** Significant of 5% level*

Classification	Hemoglobin (g/dl)	Low Income		Middle Income		High Income		'F' value
		Boys (%)	Girls (%)	Boys (%)	Girls (%)	Boys (%)	Girls (%)	
Normal	≤12	7	4	9	8	12	8	
Mild	10.0 – 11.9	25	18	22	23	18	22	
Moderate	9.9 – 7.0	4	14	5	5	6	6	
Severe	<7.0	-	-	-		-	-	

Table 8: Income wise Classification of Hemoglobin Status of the Respondents

4.Conclusion

School age period is nutritionally significant. This period is quite vulnerable and considered to be special risk group. Malnutrition during this period can interfere with school performances. Reviews of the studies, conducted on the nutritional and health status have revealed the impact of malnutrition on health. In the context of modernization, the changes in the sociological process is stated to have influenced the life cycle, food choices, eating and activity pattern of the present day children. In most of the developing countries including India, nutrition initiatives have been focusing on younger children and women, thus neglecting older children. Only recently, attention has been focused on the nutrition and health concerns of older children. One of such initiatives is introduction of mid day meal for school children.

Thus, the findings of the study are indicative of the fact that the prime reason for nutrition and health status of present day school children is inadequate in quality and quantity of food consumed. These conditions may be due to household food security, food availability, food choices, life style changes and lack of nutrition knowledge and government initiative programmes. The intake of pattern of school children showed micro nutrient deficiencies and low intake of protein rich foods. Hence, school children can be motivated through nutrition education to adopt nutrition behaviors that improve their nutrition and promote healthy life style. Government should take initiative to promote nutrition related activities in schools such as maintaining nutrition gardens in school premises and use of vegetables in the preparation of mid day meal..

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