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Research Article

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Dietary Intake from Packed Lunch of Selected School Children in UAS Campus School Hebbal Bengaluru

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ABSTRACT

The present study aimed for assessing the anthropometry and dietary intake from packed lunch. The study was conducted in UAS campus school, Hebbal, Bengaluru. One hundred and twenty school children were selected based on random sampling technique in the age group of 13-15 years studying in 8th and 9th standard, of both genders were divided into boys (n=67) and girls (n=53) groups. A well-structured questionnaire was framed to gather the information. Anthropometry was assessed by calculating BMI (Body Mass Index), SFT (Skin Fold Thickness) MUAC (Mid upper arm circumference) and dietary intake from packed lunch pattern of the subjects was assessed for consecutive 5 days. The present study revealed that, 55.2 per cent and 58.5 per cent of boys and girls, respectively were having normal BMI. With respect to MUAC and triceps skin fold thickness of the school children found lower when compared to Indian pediatric association (IAP). The mean nutrient intake from packed lunch was lower in both the groups when compared to 1/4th of their RDA. With respect to nutrition adequacy all other nutrients consumption was found inadequate in both boys and girls.

Key words: *Anthropometry, nutrient intake from packed lunch*

INTRODUCTION

Nutrition plays a vital role in growth and development of children. Inadequate nutrition may lead to malnutrition, growth retardation, reduced work capacity and poor mental and social development. These conditions if encountered during childhood can lead to a life of poor productivity and endless sufferings. Among all age groups, the school age period is nutritionally significant because this is the prime time to build up body stores of nutrients in preparation for rapid growth of adolescence. Therefore, it becomes very important to know the nutritional status of school going children, the building blocks of state and country.

The packed lunch is a meal prepared at home and packed in tiffin box to be eaten by the child in school. It can be with one compartment or two or sometime three compartments.

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Eating any type of meal for lunch can fill the stomach but to keep the children healthy and energetic packed lunch should be nutritious. Due to urbanization and changing life styles and lack of knowledge of parents and children, the Consumption pattern is changed from cereals based homemade foods to more expensive processed foods and market influence of popular fast foods. Thus changes in the dietary pattern due to urbanization in turn influenced the parents in packing their children's lunch box, which affect the nutritional status of the children. Hence the present study was conducted with the objective to assess the anthropometry and dietary intake from packed lunch of selected school children.

MATERIAL AND METHODS

The study was conducted in UAS campus school, Hebbal, Bengaluru. -65. The school is run by a private management, where the children from different social strata are present. However, the diversified background of the children was the main criteria to select for the purpose of the study. One hundred and twenty school children were selected based on random sampling technique in the age group of 13-15 years studying in 8^{th} and 9^{th} standard, of which 67 were boys and 53 were girls. A detailed data schedule was formulated after the pilot study to elicit the information on various aspects related to the assessment of pattern of packed lunch of school children and anthropometry was also done.

Nutritional anthropometry is concerned with the measurement of the variations of the physical dimensions and the gross composition of the human body at different age level and degrees of nutrition. The following measurement was taken to assess the nutritional status of the selected subjects and compared with the standard.

Weight of the subjects was taken to the nearest 0.1 kg on a calibrated portable weighing balance. Height was measured accurately to the nearest 0.1 cm using vertical rod. BMI was classified as per the WHO guidelines. The arm circumference was measured twice to the nearest 0.1 cm. The site selected for measuring mid-arm circumference was used i.e. Mid-way down the length of left arm with the arm hanging relaxed at the side.

Survey of packed lunch for five days

For consecutive 5days their lunch pattern was recorded. By the use of standard measuring vessel set of 1; standard measuring spoon of 4, cardboard discs for rotis and chapthis and rubber balls for ragi dumplings. The consumption of packed lunch quantity was recorded. The nutrient content of the food consumed by each child in packed lunch was converted into raw quantity and calculated using the formula.

$$\text{Individual intake in Terms of raw amount (g/ml) Preparation (g/ml)} = \frac{\text{Total raw amount of each ingredient Used in the preparation (g/ml)}}{\text{Total cooked amount of each}} \times \text{Individual intake of cooked amount (g/ml)}$$

Using the quantity of foods consumed during lunch time in the form of packed lunch was evaluated in terms of calories, protein, fat, carbohydrate, calcium and iron present in their packed lunch was calculated. These figures were compared against the $1/4^{th}$ of their RDA. The adequacy of consumption of nutrients was calculated using the following formula.

$$\% \text{ adequacy} = \frac{\text{Intake of each nutrient}}{\text{Recommended allowances}} \times 100$$

Statistical Analysis: Mean and standard deviation. Chi-square test was used to know the difference between male and female subjects with regard to anthropometric measurements. Statistical analysis was performed using ICARGOA statistical package.

RESULTS AND DISCUSSION

The quantity of nutrient intake from packed lunch which was consumed by the children was recorded for week during study period. And the mean packed lunch was compared with 1/4th of the recommended dietary allowances of both boys and girls depicted in **Table 1 and Table 2.**

The lunch box of selected school children brought from home was monotonous, lacking variety. The commonly packed lunch of school children was cereal based i.e. rice items (bisibele bath, vangi bath, puliyogare, lemon rice, dosa chutney etc.)

Table 1: Nutrient intake from packed lunch of selected boys for a week

Nutrients	1/4th RDA of their lunch	Mean±SD	% Adequacy
Protein(gm)	13.57	9.58±0.87	70.59
Fat (gm)	11.25	9.01±0.50	80.08
Energy(Kcal)	687	356±14.26	51.81
Carbohydrate(gm)	132.9	59.84±2.23	45.02
Iron(mg)	8	2.73±0.44	34.125
Calcium(mg)	200	52.09±4.28	26.04

The mean intake of nutrients by school children for week namely energy, protein, carbohydrate, fat, calcium, iron, presented in **Table 1.** The mean nutrient intake of energy (356 K.cl), protein (9.58 g), carbohydrate (59.84 g), fat (33.28 g), iron (9.01 mg) and calcium (52.09 mg) were less than their RDA among the boys.

In case of girls also **Table 2.** It was observed that, all the nutrient i.e. energy (346 Kcl), protein (9.21 g), carbohydrate (57.73 g), fat (8.89 g), iron (2.64 mg) and calcium (52.44 mg) were below 1/4th of their RDA. Percentage adequacy of both boys and girls was depicted in following **Fig 1.**

Table 2: Nutrient intake from packed lunch of selected girls for a week

Nutrients	1/4th RDA of their lunch	Mean±SD	% Adequacy
Protein(gm)	12.97	9.21±0.67	71.01
Fat (gm)	10.00	8.89±0.44	88.9
Energy(Kcal)	582	346±9.61	59.45
Carbohydrate(gm)	110.15	57.73±1.22	52.41
Iron(mg)	6.75	2.64±0.23	39.11
Calcium(mg)	200.00	52.44±3.19	26.22

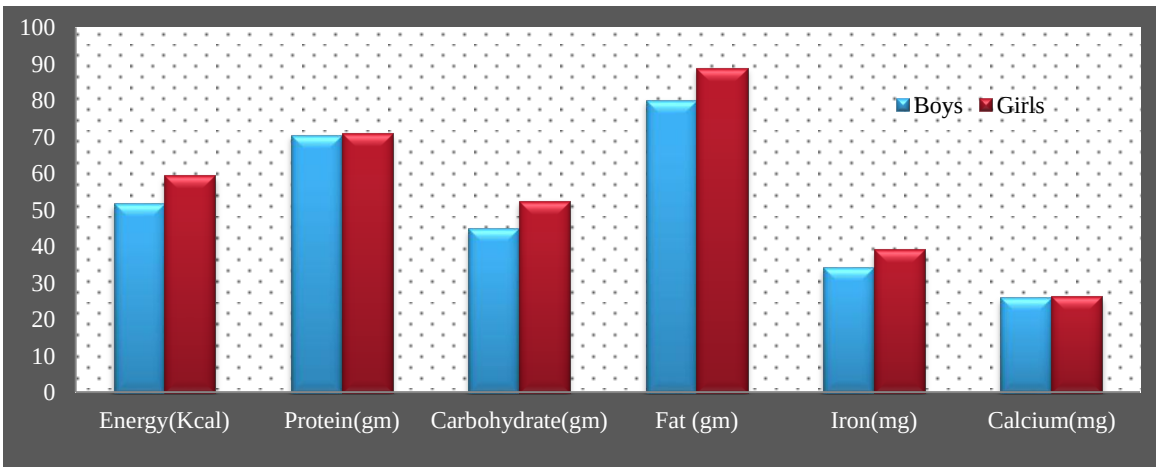

Fig 1: Percentage Adequacy of Nutrients through packed lunch of school children

Lack of nutrition knowledge, selection of food, lower purchasing and non-availability of required food item at their living place might be a contributing factor for lower intake of nutrients in their packed lunch. It has been reported that the mean nutrient intake of school children was low when compare with their RDA

Nutritional status of a larger population can be assessed quickly by recording anthropometric measurements *viz.*, height, weight, mid upper arm circumference (MUAC) and triceps skin fold thickness. These anthropometric measurements were used to calculate and classify the respondents according to Body Mass Index (BMI). These measurements were compared with IAP standards to draw the conclusion.

Table 3: Mean height of the selected school children

Respondents	Age (Years)					
	12-13		13-14		14-15	
	IAP Standard (cm)					
	148.6		156.3		160	
	N	Mean±SD	N	Mean±SD	N	Mean±SD
Boys (n=67)	2	154.4±2.1	62	142.0±15.3	3	146.0±18.3
	IAP Standard (cm)					
Girls (n=53)	149.5		152.5		155.5	
	N	Mean±SD	N	Mean±SD	N	Mean±SD
	2	130.6±10.4	49	140.4±137	2	138±21.2

In case of anthropometry measurement it was observed that the measurement was increased only in the age group of 12-13 years when compared to standard height and but in the age group of 13-14 and 14-15 years the subjects were not reaching the standard height. Whereas as in girls also none of the subjects were on par with standard height **(Table 3).**

Table 4: Mean weight of the selected school children

Respondents	Age (Years)					
	12-13		13-14		14-15	
	IAP Standard (kg)					
	37.00		42.00		47.00	
	N	Mean±SD	N	Mean±SD	N	Mean±SD
Boys (n=67)	2	42±9.89	62	40.22±8.99	3	48.33±18.3
	IAP Standard (cm)					
Girls (n=53)	37.00		42.00		45.00	
	N	Mean±SD	N	Mean±SD	N	Mean±SD
	2	32±2.83	49	42.92±8.36	2	44±4.24

Table 4. Showed that mean weight of both boys and girls shows that 12-13 and 14-15 years age subjects were reaching the standard weight. But age group of 13-14 years children was not reaching the standard weight.

Table 5: Gender wise BMI classification of selected children based on WHO classification

BMI classification	Boys (n=67)		Girls (n=53)		Combined (n=120)		Chi square
	No	%	No	%	No	%	
Underweight < 18.50	25	37.31	10	18.86	35	29.16	8.34*
Normal 18.50-24.99	37	55.22	31	58.49	68	56.67	
Overweight 25-29.9	4	5.97	10	18.86	14	11.67	
Obese ≥30	1	1.49	2	3.77	3	2.5	

*significant at 5% level

Body mass index (BMI) was recommended as the basis for anthropometric indicators of thinness and overweight. BMI provides a single index of body mass, applicable at both extremes. Majority of children of both sex were under the normal category (57 %) followed by underweight (29 %), overweight (12 %) and obese (2 %). Rashmi *et al*[2]., found that percentage of underweight was more than the normal children. But the result was on par with present study for overweight and obese condition. None of the adolescent was found in obese category in their study.

Table 6: Mean mid upper arm circumference (cm) of school children compared with standards[1]

Respondents	Age (Years)					
	12-13		13-14		14-15	
	Agarwal *et al*[1]. (1992)					
	19.50		20.40		21.20	
	N	Mean±SD	N	Mean±SD	N	Mean±SD
Boys (n=67)	2	19.05±2.33	62	18.92±1.54	3	20.33±0.57
	IAP Standard (cm)					
Girls (n=53)	20.90		21.70		22.40	
	N	Mean±SD	N	Mean±SD	N	Mean±SD
	2	17±1.41	49	18.22±1.28	2	18.5±0.71

Table 6. The mean mid upper arm circumference and triceps of both boys and girls was increased over the age gradient 12-15 but when values were compared to the reference value of each age group found to be lower than standards. This observation is in line with the findings Ruchika *et al*[3]., found that MUAC in all the age groups was significantly ($p<0.01$ %) less than the NCHS.

CONCLUSION

The importance of packing a healthy lunchbox is immeasurable because it should provide at least $1/4^{th}$ of their daily requirement. Due to urbanization and changing life styles and lack of knowledge of parents and children, the Consumption pattern is changed from cereals based homemade foods to more expensive processed foods and market influence of popular fast foods. Thus changes in the dietary pattern due to urbanization in turn influenced the parents in packing their children's lunch box, which affect the nutritional status of the children. Eating any type of meal for lunch can fill the stomach but to keep the children healthy and energetic packed lunch should be nutritious. Decision about, what type of lunch they carry to school is usually determined by parent's knowledge, influence of peer group and media.

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