

## Quality Evaluation of Breakfast Consumed by School Children

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### Abstract

The study to assess the quality of breakfast taken by schoolchildren in Jodhpur city was carried out with 150 children, purposively selected in the age group of 10-14 years of both the sexes. The eating pattern of breakfast was studied and the impact on growth was assessed, using dietary recalls and anthropometric measurements. The inadequate protein and energy intake was reflected with a high incidence of malnutrition both in boys and girls. In boys 62.66 % and the girls 41.33% studied, were reported to be underweight while 5.33% boys and 4% girls were overweight. The frequency of breakfast consumption in boys (93.33%) was slightly higher than the girls (90.66%). Due to irregular eating pattern the children reported stomach ache, giddiness and poor concentration. The influence of advertisements and peer group was attributed by the subjects on the choice of food for the tiffin. Cereals in any form and vegetables were included frequently while chocolates were incorporated sometimes in the tiffin.

### Keywords

Breakfast, Energy Intake, Malnutrition, School children, Skipping Breakfast

### Introduction

School age is the perfect time for children to learn about healthy food as they start a busy social life, have pocket money and begin to choose their own lifestyle. Children of this age and need a wide variety of foods for a well-balanced diet. The amount of physical activity they have in a day will be an important part of how much they need to eat. They learn quickly and are influenced by their friends and popular trends. Children of this age are fussy, but when busy and active, good quality food is important to keep energy levels high. A healthy morning snack at recess and one after school are usually needed each day. A balanced breakfast includes fruit, whole-grain foods, and a source of protein that includes milk and milk products. The composition of the meal makes a difference in how long breakfast will sustain a child throughout the morning. In keeping to this view the study emphasizes the quality of breakfast to be taken by the school children in packed lunch (Politt, 1995). A nutritious breakfast provides approximately one-fourth of the recommended dietary allowances (RDA) for key nutrients such as protein, vitamin A, vitamin B<sub>6</sub>, calcium, magnesium, iron and zinc (Srilakshmi, 2003).

### Material and Methods

A sample of 150 children both boys and girls in the age group 10 to 14 years were selected purposively from two public schools of Jodhpur city. In each group, 75 were boys and 75 girls. The reason for selecting school children of this age group was mainly attributed by fast growth period and the influences of the environment around. The irregular food habits like skipping meals and consumption of fast foods was found to be the major trend in today's time declining the growth of child. The quality of breakfast taken into account by pre-tested semi structured questionnaire which was designed and administered to gather data on socio-demographic profile, breakfast intake, skipping habits, food likes and dislikes. The breakfast intake for three consecutive days for each child using dietary recall was taken and compared with the Recommended Dietary allowances for the age (RDA) as suggested by ICMR.

### Results and Discussion

A total of 150 subjects, middle to high income group in the age group of 10-14 years of both the sexes were included in the study. On analyzing the food habits, it was observed that majority of subjects were vegetarian.

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The mean height was 1.37-1.57 meters for boys and 1.34-1.56 meters for girls, with the mean weight ranges for boys 29.71- 44.66 kg and for girls 30.93-40.56 kg respectively.

Liking for the specific foods is influenced by many factors. The peer influence, advertisements, packaging and convenience play important role in selecting the foods. As the results from table-1 indicate that, maggi was preferred by 36% boys and 42% girls. Besides, it *paratha* was liked by 64% of girls while only 6.67% of boys said the same. Fast food was preferred by girls more than the boys while wafers and biscuits were not preferred much by the subjects. The calculated value of  $\chi^2$  was 26.5 and was found to be significant at 0.01 level.

A healthy breakfast meets one-quarter to one-third of total energy and protein requirements. Mean nutrient intakes calculated revealed that the children's diets were inadequate compared with the recommended values for energy, protein, vitamin A, calcium and iron. Energy and protein intakes were lower than the recommended allowances for both boys and girls and similar trend was observed with other nutrients like vitamin A, calcium and iron. The energy intake values indicated a daily deficit of 200-250 kcal in breakfast. A significant number of the study children skipped breakfast and this could be the major reason for the inadequate daily energy and protein intakes. In the present study, the children met almost 60% of the RDA of energy and almost 55% of the protein requirements (Table 2).

The food groups included in the tiffin reveal the dietary intake of the children. As indicated in table-3; Fig.1, cereals in the form of rice, *chapatti*, bread and biscuits was common in both the groups 97.14% boys and 95.58% girls reported inclusion of vegetables in their packed lunch. Leafy vegetables inclusion was slightly higher in girls (98.52%) than boys (95.71%). The consumption of

milk and its products were significantly higher in girls (16.17%) than the boys (4%). Consumption of chocolates

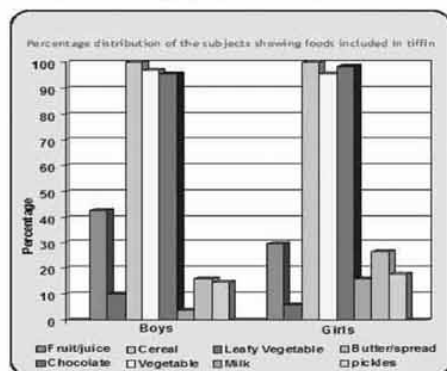


Fig. 1. Percentage distribution of the subjects showing foods included in tiffin

was seen to be higher in boys (10%) than girls (5.88%). A similar trend was observed for the fruit or juice, 42.85% of boys included it as compared to the girls (29.41%). A very little variation was seen in the consumption of wafers by boys (14.66%) and girls (17.64%). Although the eating pattern was different but the results indicated the similar findings reported by Hassan and Al-Dosari (2008) who assessed the breakfast habits and foods mostly consumed as snacks during the school day among fourth grade Qatari school children. It was stated that breakfast cereals, cheese, eggs and sweets to be more commonly included in the tiffin and the consumption of chocolates and sweets being higher in girls (56.5%) than boys (28.2%). Consumption of bakery products was also found higher among boys (45.9%) than girls (33.1%). About 80% of the children were said to consume wafers.

Table 1. Percentage distribution of general eating pattern of foods taken by school children in packed lunch

Boys	N=75	%	Girls	N=75	%
Maggi	27	36.00	Maggi	32	42.66
Pav bhaji	2	2.67	Rice/Pulao	12	16
Paratha/puri	5	6.67	Paratha/puri	48	64
Sandwich	3	4.0	Sandwich	10	13.33
Poha	2	2.67	Samosa	5	6.67
Fast foods	5	6.67	South Indian	2	2.67
No choice	29	38.67	Wafers	3	4
			Chocolate	7	9.33
			Biscuits	3	4
			Fast foods	47	62.67

Table 2. Average intake of nutrients on the basis of eating pattern in packed lunch

Nutrient	Boys		Girls	
	1/3 of RDA	Calculated Value	1/3 of RDA	Calculated Value
Energy(kcal/day)	618	405	543	346
Protein(gm/day)	11.75	6.4	11.5	6.2
Calcium(mg/day)	265	150	265	300
Iron(mg/day)	8.83	5.2	9	5
$\beta$ -carotene ( $\mu$ g/day)	1600	700	1600	620

Table 3. Percentage distribution of subjects regarding the food groups included for packed lunch

Food Choice	Boys(N=75)	Girls(N=75)	Total
Fruit/juice	42.85(30)	29.41(20)	50
Chocolate	10(7)	5.88(4)	11
Cereal	100(70)	100(68)	138
Vegetable	97.14(68)	95.58(65)	133
Leafy vegetable	95.71(67)	98.52(67)	134
Milk	4(3)	16.17(11)	14
Butter/ spread	16(12)	26.47(18)	30
Wafers	14.66(11)	17.64(12)	23

Note: figures in parentheses denote number of samples.

The specific dislikes for various food items is shown in Table 4; Fig.2 which may be due to their taste, appearance, texture or even the temperature at which they are served. If the foods are repeated very frequently they are likely to develop a dislike for those foods. The  $\chi^2$  value was found to be 89.0 for males which were significant at 0.01 level. Girls showed more varied dislikes for the foods than boys. 50.67% of boys did not have any specific dislikes while 6.67% boys and 36% girls did not like vegetables like bitter gourd and brinjal in their tiffin. 12% girls and 4% boys showed their dislike for pickle. Paratha/puri was not liked by 42.67% girls and 28% boys. Bread, poha, upma and biscuits were reported only by girls.

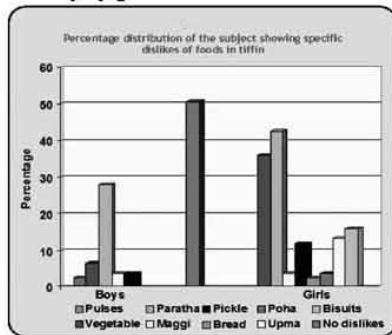


Fig.2. Percentage distribution of the subject showing specific dislikes of foods in tiffins

The results obtained in the present study with 56% of boys and 61.33% of girls skipping breakfast once a week while 6.66% of boys and 9.33% of girls skipped breakfast daily (Table 5). The  $\chi^2$  value on percentage distribution of the subjects with regard to number of times of skipping breakfast was found to be 37.9 which was significant at 0.01 level.

In a study by Chitra and Reddy (2007) results revealed that over half of the children skipped breakfast daily to once in week. A similar study by Dubey (2004) reported that 50% of the children ate breakfast regularly while two thirds of remaining skipped thrice a week and one third skipped daily.

Skipping of breakfast has several ill effects on both the physical and mental performance of the children. (Murphy *et al*, 1998) showed that the children who skipped breakfast had poor concentration were inactive, tired, lethargic and frequently complained of stomach aches. Similar results were seen in the present study where 56% of boys and 62.66% of girls reported stomach ache as the frequent ill effect of skipping breakfast. 16% of boys and 5.33% of girls reported lack of concentration (Table 6). The  $\chi^2$  value for girls was 36.3 and was found to be significant at 0.01 level.

From the present study it can be concluded that children had lower daily intakes of energy and protein when compared with the RDA given by ICMR. The foods commonly preferred by the children were *paratha*, sandwich and maggi. Preference for fast foods was seen

**Table 4. Percentage distribution of the subject regarding specific dislikes of foods in tiffin**

Boys	N=75	%	Girls	N=75	%
Dal	2	2.67	Biscuits	12	16
Veg. (Brinjal, bitter gourd)	5	6.67	Upma	10	13.33
Paratha/puri	21	28	Paratha/puri	32	42.67
Maggi	3	4.0	Vegetables	27	36
Pickle	3	4.0	Maggi	3	4
No specific dislike	38	50.67	Pickle	9	12
			Bread	2	2.67
			Poha	3	4

**Table 5. Percentage distribution of the subjects with regard to number of times of skipping breakfast**

Frequency	Boys	Girls	Total
Never	20(15)	24(18)	33
Once	56(42)	61.33(46)	88
Twice or More	17.33(13)	5.33(4)	17
Daily	6.66(5)	9.33(7)	12
Total	75	75	150

Note: figures in parentheses denote number of samples

**Table 6. Percentage distribution of the subjects regarding ill effects on skipping the breakfast**

Ill Effects	Boys(N=75)	Girls(N=75)	Total
Giddiness	25.33(19)	4(3)	22
Stomach ache	56(42)	62.66(47)	89
Nausea	9.33(7)	9.33(7)	14
Poor Concentration	16(12)	5.33(4)	16

Note: figures in parentheses denote number of samples.

more in girls than the boys. Fruits were also preferred by few children. The dislikes by the children included pickle, vegetables like brinjal, bitter gourd, bread, upma. Cereals and their products were included in the tiffin of all the children. Milk and its products were usually absent in the breakfast. Although, skipping breakfast has become the popular norm in modern day's life because of changes in family lifestyle and affects their optimal growth and development. Over half of the school children studied skipped breakfast frequently, the main reason was being dislike for the food. Stomach ache was the most common ill effect on skipping

breakfast and was reported more by the girls while poor concentration was seen more in boys. Giddiness and nausea were also found as the ill effects on skipping the breakfast. The data reveal the importance of breakfast which coincides with the overall dietary quality and adequacy in tiffin of schoolchildren. The results of the study indicate that there is a need to educate urban parents with respect to proper distribution of meals, selection of foods and the importance of providing at least one-third of the day's requirement through breakfast.

## References

- Chitra, U., Reddy, C.R. (2007) The role of breakfast in nutrient intake of urban school children. *Public Health Nutrition* 10:55-58.
- Dubey, N. (2004) Breakfast eating patterns of school children and their impact on performance in various tasks. *Farm Science Journal* 13:189-191.
- Gupta, S.P. (1999) Statistical Methods. Sultan Chand and Sons Publication. New Delhi.
- Hassan, A.S., Al-Dosari, S.N. (2008) Breakfast habits and snacks consumed at school among Qatari schoolchildren aged 9-10 years. *Nutrition and Food Science* 38:264-270.
- Jelliffe D.B. (1966) The Assessment of nutritional Status in Community Monograph 53.WHO, Geneva, Switzerland.
- Joshi, S.A. (2002) Nutrition and Dietetics. 2nd ed. Tata McGraw Hill Publishing Company Limited. New Delhi.
- Murphy, J.M., Pagano, M.E., Nachmani, J., Sperling, P., Kane, S., Kleinman, R.E.(1998) The Relationship of School Breakfast to Psychosocial and Academic Functioning. *Arch Pediatr Adolesc Med* 152:899-907.
- Pollitt, E. (1995). Does breakfast make a difference in school? *J Am Diet Assoc* 10: 1134-1139.
- Srilakshmi, B. (2003) Dietetics. 4th edition. New Age Publishers. New Delhi.
- Williams, P. (2007) Breakfast and the diets of Australian children and adolescents: an analysis of data from the 1995 National Nutrition Survey. *Int J Food Sci Nutr* 58: 201-16.