

Assessment of Breakfast Consumption Pattern among Urban School Children

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ABSTRACT

The present study was undertaken to ascertain the breakfast consumption habits in the urban school going children. The children aged 10-12 years studying in the government school of Bengaluru were selected for the study. Twenty seven per cent of the children did not skip breakfast and 73 per cent of them skip breakfast one or the other day during a week period. The mean macronutrients intake *viz.*, energy, protein and fat among breakfast consumers were found to be 1410 Kcal, 34.33 g and 28.16 g, respectively. Whereas, the breakfast skippers had lower macronutrients intake (Energy: 1134Kcal, Protein: 30.62 g and Fat: 23.70 g). The mean micronutrients intake such as calcium, iron, carotene and vitamin C were found to be higher in the breakfast consumers compared to breakfast skippers (Calcium (mg): 559.59 vs. 510.78; Iron (mg): 16.43 vs. 11.21; Carotene (μ g): 1318.78 vs. 881.99; Vitamin C (mg): 36.75 vs. 29.64). However, the nutritional adequacy was not met in spite of breakfast consumption among these children.

Keywords: Breakfast consumption, school children, behavior, breakfast skipping, nutrient intake

CHILDREN are the wealth of any nation as they constitute important segment of the population. Children in the age group of 5-14 years are often considered as school age. School-aged children grow significantly, but at slower rate, whilst being physically very active in general. The school age period has been called the latent time of growth. School going children go through remarkable physical changes of all kinds; their food intake becomes a critical aspect for the growth and development. During their growing period, care should be taken to include all the nutrients in their diet.

Breakfast has earned the title as the most important meal of the day, yet it is the meal most often missed. Breakfast is the first meal of the day and is typically taken no longer than mid-morning. A team of researchers found that there may be some truth in the old saying “eat breakfast like a king, lunch like a prince and dinner like a pauper” – may be the key to a healthy body and mind.”

Breakfast is important in meeting the day's nutritional needs. Children who consume breakfast are likely to meet their energy and overall nutrient requirement compared to those who do not have breakfast (Intifuli and Lartey, 2014). In India, children

between 10 and 15 years who consumed breakfast met about one quarter to one third of their daily energy and protein intake from the breakfast meal. Breakfast meal contribute to improving cognition among school age children (Chitra and Reddy, 2007).

Despite the importance of breakfast consumption, a high prevalence of skipping breakfast among children and adolescents is widely reported in many countries across the world (Wang *et al.*, 2016). Skipping breakfast has become the norm in modern day India because of changes in family lifestyle. When this happens largely among children, it can result in their suboptimal growth and development - a factor important to the future human resource development of the country. It is estimated that several children attend school daily without having eaten breakfast and many more consume an inadequate breakfast. In India, the proportion of children skipping breakfast regularly was higher (50%). Breakfast skippers in India have been shown to have inadequate intake of key nutrients that could not be made up at later meals, including macronutrients like energy and protein and micronutrients like vitamins A, C and iron (Arora *et al.*, 2012).

The dietary intake patterns of the children have been a special concern since it was found that eating patterns formed in early life are likely to persist into adulthood. Hence, the present study was undertaken with the objective to determine the breakfast consumption habits in relation to the nutrient intake.

MATERIAL AND METHODS

Subjects and study area

The study was conducted on 100 school children aged 10-12 years studying in 5th, 6th and 7th grades in Government Higher Primary School located in Byataryanapura, Bengaluru.

Data collection

A detailed interview schedule was formulated to elicit the information about the subjects regarding age, religion, food habit, family type, etc. Information on breakfast consumption pattern of all the children were collected through structured schedule and specifically, they were asked about frequency of consumption for past one week, if breakfast was skipped and the reasons for skipping were sought. Information on behavior of the children during breakfast consumption was also obtained.

Dietary intake in terms of nutrients was assessed for the subjects through 24 hour recall method for one week. The 24 hour recall consisted of listing all foods consumed on the day previous to the day of interview.

Baseline diet survey of the subjects was conducted by using 24 hour recall method using standardized cups, vessels, paper discs and rubber balls. Subjects were asked to recall the type of preparation made for breakfast, lunch, evening tea and dinner etc. for the seven days. Since the primary focus of the paper was on breakfast, dietary data on breakfast intake alone were also collected for one week and the average intake was computed.

Information on account of raw ingredients used for each preparation and also on the total cooked amount of each preparation was recorded in terms of standardization tools (standardization as per the procedure indicated by Bamji *et al.* (1996). The average raw ingredients in all the meals consumed by

each subject per day were calculated. Using the quantity of foods consumed per day, nutrient intake was calculated (Gopalan *et al.*, 2007). Intake of energy, protein, fat, minerals (calcium and iron) and vitamins (β -carotene and vitamin C) were calculated for breakfast and for the day's diet. All nutrient calculations were based on the nutritive value of raw ingredients per 100 g of edible portion as available in the Indian food composition Table.

Further, nutrient intake obtained through breakfast was compared with total daily nutrient intake. Per cent contribution of breakfast to the total daily nutrient intake was also calculated.

Definition of the breakfast meal

For the purpose of present study, Breakfast was defined as "the first meal of the day that has been taken in the morning before going to school".

Criterion of a nutritionally adequate breakfast

The "nutritionally adequate breakfast" used in the paper refers to breakfast that promises at least 25 per cent of the RDA for energy.

Data analysis

The study data obtained was subjected to statistical analysis with appropriate tools. Descriptive statistics like mean and standard deviation were calculated.

RESULTS AND DISCUSSION

The general information of the children are depicted in Table I. Of the 100 children surveyed, 57 per cent were boys and 43 per cent were girls. Non-vegetarians predominated with 83 per cent followed by vegetarians (17%). Most of the children belongs to nuclear families (76%) and 24 per cent of the children were having joint families. Majority of the children belong to hindu religion (99%).

In the present study, 83 per cent of the children were found to be non-vegetarians and 17 per cent were vegetarians. Similar results were found in the study conducted by Mukherjee and Chaturvedi (2017) where the percentages of non-vegetarians were more (55%) than the vegetarians (6%).

TABLE I
General information of the subjects

Characteristics	No.
<i>(n=100)</i>	
Age (years)	
10	40
11	34
12	26
Gender	
Male	57
Female	43
Religion	
Hindu	99
Muslim	0
Christian	1
Family type	
Nuclear	76
Joint	24
Food Habit	
Vegetarian	17
Non-vegetarian	83

The children who eat breakfast regularly were called as breakfast consumers and those who skip one or the other day during a week period were termed as breakfast skippers. Gender wise distribution of subjects based on breakfast consumption behavior is presented in Table II. Seventy three per cent of the children skip breakfast and only 27 per cent of them had breakfast regularly. Majority of boys (40%) outnumbered the girls (33%) with regard to breakfast skipping. Similarly, majority of boys (17 %) had regular breakfast compared to girls (10%).

TABLE II
Gender wise distribution of subjects according to the breakfast consumption behavior
(n=100)

Breakfast consumption behavior	Boys (n)	Girls (n)	Total (n)
Breakfast consumers	17	10	27
Breakfast skippers	40	33	73

Frequency of breakfast skipping for the past one week among children is presented in Table III. Of all the children studied, 27 per cent did not skip breakfast

TABLE III
Frequency of Breakfast skipping pattern of the school children for past one week
(n=100)

Breakfast skipping pattern	No.
Skip breakfast	
1-2 times/week	27
3-4 times/week	34
> 4 times/week	12
Did not skip breakfast	
	27

at all, 27 per cent skips 1-2 times in a week, 34 per cent skips 3-4 times a week and 12 per cent of the children skips more than four times in a week. This indicates that most of the children skips breakfast one or the other day during a week period. However, the percentage of skipping breakfast for more than four times was less compared to other groups. This means majority of the children had breakfast more often during a week period. These results were in consistent with the study conducted by Juan (2006) who reported that 13 per cent of the Spanish children did not had breakfast or had inadequate breakfast. In another study conducted by Vanelli *et al.* (2006) reported that 78 per cent of children usually had breakfast, but 22 per cent reported skipping breakfast. Similar results were found in the present study which depicts that the children had breakfast one or the other day during a week period. The most common reasons for skipping breakfast were listed as waking up late in the morning (42.5%), do not like to eat in the morning (34.2%), mother is busy (30.1%) and busy in playing the games (17.8%) (Table IV). These results indicate poor time management as a major reason that prevented children from eating breakfast and mothers from preparing the same.

Behavior of the subjects during breakfast consumption is depicted in Table V. Sixty five per cent of the subjects eat breakfast with / without grumbling followed by 27 per cent of the subjects demand for particular item. Sixteen per cent of the subjects ask

TABLE IV
Reasons for skipping breakfast
(n = 73)

Reasons*	No.	%
Mother is busy	22	30.1
No one to prepare breakfast	9	12.3
Do not like to eat in the morning	25	34.2
Got up late in the morning	31	42.5
Eat only his/her choice of foods	6	8.2
When someone scolds, misses the breakfast	6	8.2
If eat biscuits and tea, miss the breakfast	5	6.8
Always interested in playing, go and join the friends, miss the breakfast	13	17.8

*Multiple responses

TABLE V
Behavior of the subjects during breakfast consumption

Behavior of the child#	No.
Eat without grumbling/with grumbling	65
Crying and eating	12
Demanding for particular item	27
Asks for food which is not prepared	16
Throwing the breakfast plate	2
Leave the breakfast halfway everyday	15

#Multiple responses

for food which is not prepared for the breakfast, whereas, 15 per cent of the children leave the breakfast halfway.

Based on whether breakfast was consumed or not for the past one week, the energy and nutrient intake of the two groups of children (breakfast consumers vs. breakfast skippers) were compared (Table VI). The mean macronutrients intake *viz.*, energy, protein and fat among breakfast consumers were found to be 1410 Kcal, 34.33 g and 28.16 g respectively whereas the breakfast skippers had lower macronutrients intake (Energy: 1134Kcal, Protein: 30.62 g and Fat: 23.70 g). The mean micronutrients intake such as calcium, iron, carotene and vitamin C were found to be higher in the breakfast consumers compared to breakfast skippers (Calcium (mg): 559.59 vs. 510.78; Iron (mg): 16.43 vs. 11.21; Carotene (μ g): 1318.78 vs. 881.99; Vitamin C (mg): 36.75 vs. 29.64). However, the nutritional adequacy was not met in spite of breakfast consumption among these children.

Breakfast meals varied from traditional South Indian breakfast items based on cereal/pulse combinations like dosa and idli to cereal-based items like chapatti (unleavened whole wheat bread), puri (unleavened whole-wheat bread that is deep fried), upma and rice. The beverages commonly consumed were milk, coffee and tea along with biscuits.

The contribution of breakfast to the total daily energy and nutrient intake was determined and compared between breakfast consumers and skippers (Fig. 1). The breakfast consumers had higher intake

TABLE VI
Comparison of mean nutrient intake between breakfast consumers and breakfast skippers

Nutrients	Breakfast consumers (n=27) Mean \pm SD	Breakfast Skippers (n=73) Mean \pm SD
Protein (g)	34.33 \pm 1.21	30.62 \pm 1.26
Fat (g)	28.16 \pm 0.83	23.70 \pm 0.32
Energy (Kcal)	1401 \pm 97.52	1134 \pm 25.89
Calcium (mg)	559.59 \pm 11.67	510.78 \pm 1.69
Iron (mg)	16.43 \pm 1.05	11.21 \pm 0.47
Carotene (μ g)	1318.78 \pm 76.43	881.99 \pm 44.21
Vitamin C (mg)	36.75 \pm 1.64	29.64 \pm 1.38

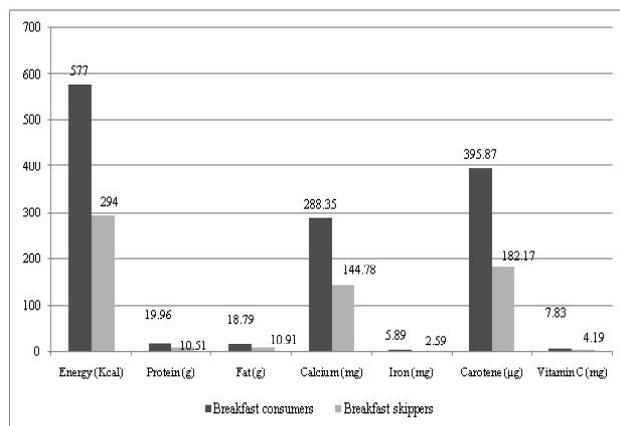


Fig. 1: Percent contribution of breakfast meal to the total daily nutrient intake among breakfast consumers and breakfast skippers

of energy and other nutrients compared to breakfast skippers. Although, the breakfast consumption resulted in higher intake of nutrients, the nutritional adequacy was not achieved even in the children who took breakfast regularly. This indicates a poor nutrient intake among those who skips breakfast which will have an impact on the nutritional status in future. The results were in consistent with the study conducted by Intifuli and Larthey (2014) who reported that the breakfast meal contributed between 32 and 41.3 per cent of the total daily energy and between 23.4 and 55.7 per cent of the other nutrients.

The consumption of breakfast should be the common practice among the school children. Children who had breakfast generally had higher nutrient intake than children who did not. Encouraging breakfast consumption among school children is a way to ensure that they meet their daily nutrient and energy intake. The results of the study indicate that there is a strong need to educate urban children with respect to the importance of consuming breakfast.

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(Received : May, 2017 Accepted : August, 2017)