

Effect of breakfast eating pattern of school going children on their anthropometric & school performance in Lucknow

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Abstract - A nutritional adequate breakfast is considered an important part of the nutrition. Food which consumed at the beginning of the day for achieving and maintaining the proper physical and mental health. This fact is based on several controlled studies that have been carried out to determine the effect of different breakfast habits on the physiological responses, attitudes & scholastic achievements of the school going children under the study.

Index Terms – Breakfast pattern, children, anthropometric, school performance.

1 INTRODUCTION

BREAKFAST is the most important meal of the day because after 10-12 hrs overnight without food our energy resources are low and our body & perhaps more importantly our brain needs fuel. So it is the opportunity of the day to fuel the body & get the metabolism running. Several studies suggest that eating breakfast may help children do better in school by improving memory, alertness, concentration, problem solving ability, test scores, school attendance & mood. It also helps children perform better in school in both mathematical & Creative tasks. This is thought to be due to the fact that breakfast, especially if it is high in carbohydrates, provides glucose- the preferred fuel for the brain. In a series of memory & recall tests, it was found that eating breakfast significantly improved performance at information retention tasks. Recollection speed was also enhanced. Studies shows that breakfast eaters are more likely to meet their nutrient intake recommendations. Hence people who skip breakfast may not makeup for missed nutrients later in the body.

The NEW HARVARD RESEARCH SCHOOL breakfast programme focused on breakfast eating habits of & found that this meal gives to children a good start in terms of energy & performance in various task.. This ensuring that children eat a nutritious breakfast everyday is one of the most important contributions that parents can make to their children health, well being & success.

Studies have reported that millions of children attend school on an empty stomach half to two third of school children had poor breakfast. Most of the research studies however have been reported from the developed countries. Only one study reported that 38% of children of government school came without breakfast 44% with only milk & only 18% had cereal chapatti with tea.

A study on breakfast eating pattern of 9 to 10 years old was contributed on 100 school children of Lucknow & their impact of growth was studied using 24 hours recalls method. The respondents belong to middle income group.

2 MATERIAL & METHOD

The breakfast eating habits of group were determined through questionnaires designed for children & their parents. Twenty four hours dietary recall methods were used to assess dietary intake on any one school day. The nutritional contribution of their diets were then calculated using the food composition tables (National Institute of Nutrition, 1999, ICMR) & the nutritional adequacy ratio was calculated Anthropometric measurement such as weight, height, mid upper arm, circumference (MUAC), triceps, skin, fold measurements.

3 RESULT AND DISCUSSION

The results obtained were correlated with breakfast eating habits of the children to determine, if missing breakfast had any impact on their growth & development. The data revealed that only 50% of children ate breakfast regularly everyday & of the rest 50% two third ate breakfast three days a week while one third skipped it all together. The reasons for skipping breakfast were like: waking up later, not hungry, dislike the food offered, busy doing homework. No one to eat with & feel sick, which more based on questionnaire used for the purpose. A larger number of boys gave the first two reasons & none of them reported that they were busy doing homework, while more girls gave the five reasons for missing breakfast of the breakfast eaters, however 37% said that they enjoy the meal and overall gave the reasons for eating it viz, most important meal, prevented head & stomach aches, to gain weight & habit while 46.7% subjects considered it to be most important meal, 33% stated the second reasons while only 10% ate breakfast eating to gain weight. The perceptions of the subjects parents with respect to breakfast

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eating were also recorded & it was found that 48% believed that eating this meal leads to better thinking & work efficiency, 23% said it kept the child active throughout the day, 19% reported no complaints about head & stomach aches, 10% felt that it was most nutritious of the day.

4 CONSUMPTION PATTERN

The food consumed varied from bread based items such as sandwiches, toast burgers to dalia cornflakes, paratha, milk,

TABLE 1: Comparison of mean daily nutrient intake of 9 years old boys & girls & 10 years old boys & Girls breakfast eaters

Nutrients	Nine Years			Ten Years			
	RDA	Boys	Girls	RDA	Boys	RDA	Girls
Energy (kcal)	1950	1984	1652	2190	2010	1970	1823
Protein (g)	41	49	44	54	56.9	57	56.7
Calcium (mg)	400	548	539	600	617	600	679
Iron (mg)	26	15.9	15.2	34	18.3	19	17
β-carotene (mg)	2400	467.2	269.7	2400	1120	2400	591
Vitamin-C (mg)	40	57.2	68.7	40	69.7	40	46
Thiamine (mg)	1.0	1.1	1.2	1.2	1.3	1.0	1.1
Riboflavin (mg)	1.2	1.3	1.2	1.5	1.4	1.2	1.2
Niacin (mg)	13	11.7	11.2	16	11.3	13	8.9

*RDA as suggested by ICAR

TABLE 2: Comparison of mean daily nutrient intake of 9 & 10 years old boys & girls breakfast skippers.

Nutrients	Nine Years			Ten Years			
	RDA	Boys	Girls	RDA	Boys	RDA	Girls
Energy (kcal)	1950	1319	1229	2190	1283	1970	1209
Protein (g)	41	38.9	34.3	54	30.4	57	30.6
Calcium (mg)	400	369	399	600	351.3	600	360.9
Iron (mg)	26	9.8	10.3	34	7.4	19	8.4
β-carotene (mg)	2400	229	191.7	2400	346	2400	218.7
Vitamin-C (mg)	40	37	26.3	40	15.2	40	19.1
Thiamine (mg)	1.0	0.91	0.97	1.2	1.0	1.0	0.89
Riboflavin (mg)	1.2	0.87	0.67	1.5	0.79	1.2	0.87
Niacin (mg)	13	8.31	8.17	16	9.07	13	7.31

* RDA as suggested by ICAR

The values are presented in the table 1 & 2 which indicates that they are inadequate in all respects, when compared to recommended values of nutrients for 9 to 10 years old. The BE groups showed deficient intake of iron, β-carotene & niacin, where as the BS groups has distinctly lower values than breakfast eaters. Similar results have been reported by researches from developed countries. The mean energy intake of BS was significantly lower than BE (t=5.89). The value a deficit of 650-750 Kcal. As against that for BS which was 650-900 kcal/per day. The trend was the same for nutrients, although in case of B-carotene iron, both the breakfast eaters & skippers were found short of the recommended values for their age. This was attributed to the low intake of green leafy vegetables in the daily diet & low bioavailability of iron from cereal based diets. Experts

coffee, fruits a juices, It was noted that 65% children never took fruits & 80% consumed sandwiches or burgers & coffee more often, only 7% - 8% ate paratha with plain milk.

5 NUTRITIONAL INTAKE

The mean nutrients intake of Breakfast eaters (BE) & Breakfast skippers (BS) diets from 24 hours recall were calculated using food consumption tables.

for B. vitamins & vitamin C the diets of Breakfast skippers fell short of the recommended Dietary Allowance (RDA) for all nutrients in contrast to those of breakfast eaters.

6 NUTRIENT INTAKE

The nutrient composition of breakfast eaten by the group BE was calculated. The mean nutrient value for breakfast alone are represented in table-3 which indicated that eaters meet one fourth to one third total daily energy & protein requirements. The 9 yrs old consumed more protein requirement. So the 9 years old children consumed more protein & fat requirements than the 10 years old children both boys & girls.

TABLE 3: Mean Nutrient Intake of the Groups for Breakfast

Nutrient	Boys		Girls	
	9 yrs	10 yrs	9 yrs	10 yrs
Calories (Kcal)	679	732	724	583
Protein (g)	24	23.9	23.6	18.9
Fat (g)	23.4	29.5	24.4	19.9
Carbohydrate (g)	104.1	104.7	110.3	83.2

The breakfast contributed 55-57% of the energy from carbohydrates, 12-13% from protein as against the 20% recommended & 28-33% from fat in the two age groups. The studies defined a basis breakfast as one that provides one fourth the total requirements for the energy & protein. (table-1)

6 BREAKFAST & SCHOOL PERFORMANCE

School performances were judged by using the attendance, class test performance & participations in extra-curricular activities of the subjects as indicators.

7 ANTHROPOMETRY

More than 50% of the breakfast Eaters reported that they never missed school as against 23% breakfast skipper. The BS 76.7% reported missing school frequently due to sickness 60.9%, fear of test 8.7% & did not feel like going to school 17.4% in contrast to the percentage for BE which were 46.7%, 0.0% & 26.9% respectively. BE 80% did not miss class tests were as only 38% skippers appeared regularly. BE 56.9% scored good marks as compared to 36.9% skippers who showed poor performance.

TABLE 4: Anthropometric measurement in the form of the mean values of BE & BS

Nutrients intake by age	Height (cm)		Weight Kg.		MUA C(cm)		Triceps (mm)	
	BE	BS	BE	BS	BE	BS	BE	BS
9+ Boys	133.7± 4.2	1131.1± 7.9	30.5± 7.83	26.7± 4.47	19.74± 3.52	18.46± 1.51	12.2± 7.86	8.87± 2.17
9+ Girls	134.4± 4.4	128.6± 3.21	31.1± 4.93	25.6± 3.59	20.2± 2.27	17.8± 1.21	10.3± 1.98	8.9± 1.4
10+ Boys	137.9± 4.8	135.5± 3.2	30.6± 2.87	26.7± 2.13	19.7± 1.12	18.9± 1.88	11.36± 2.16	9.3± 1.84
10+ Girls	134.3± 5.2	135.2± 4.25	30.3± 2.6	29.3± 3.85	20.1± 1.93	18.8± 1.28	9.75± 1.96	9.7± 1.15

Results of participation in extra curricular activities showed 65% eaters & 54% skippers took active part in extra curricular activities. BE performed higher in sports 69% as compared to skippers 34%. The study revealed that over half the group skipped breakfast frequently or altogether. The main reason being getting up late indicating better attention to time management both by parents & children was needed avoiding late right on school days. Omission of breakfast is one of the major contributing factors leading to inadequate nutrient intake during growth period of the groups. Breakfast skipping has shown a relationship to varied behavior in children as well as in their hunger patterns. Hungry children suffered from head & stomachs frequently also affected their concentration in class. Anthropometric measurement revealed that skipper had a lower growth profile than breakfast eaters. The growth rate of eaters corresponds to the growth patterns of their counter parts in developed countries. Skipping breakfast can affect physical & mental development in children.

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