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Dietary Assessment of School Going Children from Sonepat District, Haryana

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Abstract

A wealthy nation begins with healthy children. Therefore children and their well being are the basic concerns of every nation. Good nutrition is important throughout childhood because under nutrition during the first few years of life decreases adult body size and physical output when the growth rate is high. The high level of nutritional deprivation combined with heavy burden of disease at young age has negative consequences which will be expressed during adult life. The present study entitled "Effect of supplementation and nutrition education in addition to mid day meal on nutritional status of school children in Sonepat district of Haryana" was carried out in Department of Food and Nutrition at B.P.S. Institute of higher learning, B.P.S. Women University of Khanpur Kalan, Sonepat (Haryana). In this study it was found that cereal intake of school going children was 172.75 g which was 95.55 per cent of RDI. Intake of green leafy vegetable of school going children was 32.19 g/day which was significantly ($P \leq 0.01$) lower than RDI. The study concluded that intake of all foods except cereals was significantly lower than RDI. Therefore children and their mothers need to be educated for improving their nutritional status.

Keywords: Food, Assessment, School Going Children, Recommended Dietary Intake.

Introduction

School age is a dynamic period of physical growth and development. In this age mental, emotional and social changes also take place and the need for a nutritionally adequate diet is of permanent importance for optimum growth and development. Their proper development is imperative for healthy and better future. They are a group at great risk in regard of health.

Children are the wealth of a nation and healthy children are the supreme asset and future of any nation. In India, approximately 19% (190 million) of the growing population comprises school-aged children (Srihari et. al., 2007). It is the period of utmost significance and presents a general health status of a community and nation as a whole. Adequate nutrition plays an important role in growth and development which may also effect the growth in later years of life. Children who fail to grow optimum during this crucial period may not make-up the loss in growth even on excellent diet in later life. Studies have shown that the performance of children, who had earlier suffered from malnutrition, was clearly inferior to that of children who had not gone through malnutrition.

Good nutrition is important throughout childhood because under nutrition during the first few years of life decreases adult body size and physical output when the growth rate is high. The high level of nutritional deprivation combined with heavy burden of disease at young age has negative consequences which will be expressed during adult life. Hence the school age period is nutritionally significant and children are considered to be the special risk group. Malnutrition during this period results in inferior school performance, working ability and physical growth (Kumari, 2005).

Objective

To assess the dietary intake of school going children (7-9 years).

Hypothesis

School going children will consume food as per RDI or inadequate intake. Similarly nutrient intake will be as per RDA or inadequate intake.

Review of Literature

Manu and Kheterpaul (2005) reported that daily mean intake of all foodstuffs viz. cereals, pulses, green leafy vegetables, roots and tubers, other vegetables, fruits, fats and oils, milk and milk products and sugar and jaggery was lower than their respective RDIs among preschoolers

(Preschoolers) except roots and tubers which were consumed in adequate amount by boys of the same age group. The intake of protein, fat, calcium, thiamine, folic acid and vitamin B12 was equal or more than their adequate amount as recommended by Indian Council or Medical Research. On the other hand, intake of energy, β-carotene, riboflavin and niacin was marginally adequate as their respective RDAs. The most limiting nutrients in their daily diets were iron and vitamin C.

Dietary surveys conducted in various parts of the country have shown that majority of our school children consumed inadequate amount of cereals, pulses and green leafy vegetables. The deficit in food intake were replicated in the nutrient intake i.e. energy protein, vitamin A, riboflavin, iron and folic acid (NCHS, 2006; NNMB, 2006-07).

Neelam *et al*. (2007) assessed the nutritional status of school children (7-9 years) of two blocks of Chamba district and it was reported that intake of cereals was higher than RDA and intake of other food stuffs like pulses, GLV, roots and tubers, other vegetables, milk and milk products, sugar and jaggery etc. was lower than RDA by the respondents of both the blocks. The energy, fat, iron, carotene and riboflavin intake was less than RDA while intake of other nutrients like protein, calcium, thiamine, niacin and ascorbic acid was higher than RDA in school children of both blocks.

Sati and Dahiya (2012) conducted a study on 200 rural school going children (7-9) years in Hisar district to assess the nutritional status. Food consumption pattern revealed that the daily mean intake of the food groupe i.e. cereals, pulses, fats and oils, sugar and jaggery, milk and milk products, green leafy vegetables, other vegetables, roots & tubers and fruits was found to be significantly lower than the recommended dietary intake, however the intake of pulses was adequate (60.98%).

Abdelazizl et al. (2015) conducted a community based cross-sectional survey to determine the nutritional status and dietary habits of school children aged (5-19 years) in Beni Suef Governorate, Egypt.. Weight, height and age data were used to calculate z-scores of the three different nutritional indicators. Dietary habits were studied using a food frequency questionnaire. Obtained BMI z-scores as revealed that 2.8% children were underweight (<–2SD) and 34.4% were obese (>+2SD). More boys were found to be underweight (3%) than girls (2.2%).

Katyal and Boora (2015) conducted a study in Rohtak district, Haryana to assess the nutritional status of 7-9 years school going children. A total of 200 school going children were selected randomly from four different schools in the study area and the nutritional status was assessed by anthropometric measurements. Among 200 students, 29% of the students were found to be moderately underweight, 7.5% were severely underweight, 24 and 10 per cent were moderately and severely stunted, 16 and 7% were moderately and severely wasted.

Patel et al. (2016) reported percentage of stunting (24% boys and 19% girls) and wasting (17% boys and 18% girls) was significantly higher in adolescent receiving MDM, while the percentage of risk of being overweight i.e. BMI for Z (BAZ)> 1 or above 85th percentile (18% boys and 12% girls) was predominant in non-MDM receiving adolescents.

Bora and Kulshreshtha, (2016) revealed that consumption of foods like cereals, pulses, fruits, GLV's, milk and milk products, fats and oils, sugar and jaggery were inadequate in the diets of both boys and girls of U.S. Nagar district of Uttarakhand state. Nutrients like energy fat, β carotene, B Complex Vitamins, Vitamin C, iron and calcium were found limiting in the diets of school children. It was found that family size, father's occupation and parents' eduation had significant effect on food intake of school children. The study emphasized the need to educate mothers of school children.

Parkash and Yadav (2017) reported that the prevalence of underweight, wasting and stunting was 7.40%, 52.59% and 28.88%, respectively. The highest number of boys were in underweight than girls in 7-9 years age and was statistically insignificant. Most of the boys were wasted than girls in 10-12 years with 47.88% followed by 13-15 years of 21.12% and was statistically insignificant. The highest number of respondents were stunting in 10-12 years age 48.71% followed by 13-15 years age with 30.76% and was statistically insignificant.

Zeru et al. (2017) reported that the prevalence of stunting, wasting and underweight of school children of Ethiopia were 36%, 50.5% and 58.70% respectively. The prevalence of malnutrition in the study area was higher than the national level. Nutritional status of children and predictors had a significant influence on the educational programme of school children. Provision of school meals or initiation of school feeding programme is recommended.

Kumari and Dahiya (2017) reported that mean daily intakes of nutrients such as energy, fat, β carotene, B complex vitamins, vitamin C, Iron and calcium were found significantly lower than their respective RDAs in the diet of rural school children 7-9 of Bhiwani district. It was also observed that the nutrient intake was higher in boys as compared to girls and intake of energy and protein was margninally inadequate (50-74.9% of RDA). The most limiting nutrient in diet of majority of respondents were iron, β carotene, Thiamine, folic acid and Vitamin B12 in school children of both the villages.

Jain et al. (2018) reported that according to weight for Z score, 5.8% were underweight and 0.83% were severely underweight. Nutrient adequacy was inadequate for energy and iron, and was 75% higher than normal for fat. As per HEI-C diet quality of all the subjects was poor. Diet quality was not associated with anthropometric measurement of subjects. Weak positive correlation was observed in nutrient intake and diet quality score and no significant association was found between nutritional status and diet quality ($p>0.05$) and socio economic status and diet quality ($p>0.05$)

Material and Methods

The present study entitled "Effect of supplementation and nutrition education in addition to mid day meal on nutritional status of school children in Sonepat district

of Haryana" was carried out in Department of Food and Nutrition at B.P.S. Institute of higher learning, B.P.S. Women University of Khanpur Kalan, Sonepat (Haryana). Nutritional analysis of food samples served in mid day meal was done. Nutritional status of school children (7-9 years) was assessed through dietary intake. Dietary intake was assessed by 24 hour recall method. Nutrient intake was calculated using ICMR dietary guidelines.

Research design

List of schools in sonepat district was obtained from district education office. One hundred rural school children in the age group of 7- 9 years from two schools were selected randomly , similarly One hundred urban school children were selected from urban schools .

Result

General information of school going children under the present study considered the information regarding some important ecological and socio-personal variables viz. sex, family type, family size, religion, parents education, parents occupation. In the present study 200 school going children were selected randomly from schools of both rural and urban area. Out of 200 selected students 50 per cent were boys from urban and rural area and 50 per cent were girls from urban and rural area. Type of family was classified in terms of joint and nuclear family. Results revealed that almost equal percent children belonged to nuclear (51) and joint family (49) in urban area while 51 per cent belonged to joint family and 49 per cent to nuclear family in rural areas. Information on family size indicated that maximum respondents i.e. 48 per cent and 55 per cent belonged to medium family size in urban and rural area, respectively. In urban area 45 per cent respondents belonged to small family size whereas only 36 per cent of rural children belonged to small family size. Rest 7 per cent respondents in urban area and 9 percent in rural area had large family size.

Caste is an independent variable which determined the social status of the respondents. In the present study, 50 percent of the respondents were from general caste followed by 26 per cent who belonged to backward caste and 24 percent to scheduled caste, respectively in urban area. In contrast only 60 per cent respondents from rural area belonged to schedule, while equal percentages (35%) of respondents were from backward and general caste. Out of total respondent 42 per cent of these fell in general caste categories against 30 and 27 per cent of backward and scheduled caste category. The educational status of respondents father highlighted that 39 per cent fathers of urban children were illiterate while 30 per cent rural respondents fathers were illiterate. Almost similar percentate i.e. 18 per cent of father were educated up to primary class in urban and 17 per cent of father were educated up to primary class in rural areas. Remaining were educated up to 12th (4%), matric (24%) and middle class (15%) in urban area whereas 7, 31 and 15 per cent fathers were educated up to 12th, matric and middle in rural area, respectively.

Higher number (58%) of urban mother were illiterate as compared to those in rural area (51%). Urban mothers (22 percent) and 16 percent rural mothers were educated upto primary. 10 percent each of urban mothers were educated upto 8th, 10th and 12th standard. Fourteen percent rural mothers were educated upto 8th and 10th standard.

Table-1 General background information of School children (n=200)

Characteristics	Area		Total n = 200	
	Urban (n=100)	Rural (n=100)	No.	% age
Sex				
Boys	50	50	100	(50%)
Girls	50	50	100	(50%)
Family Type				
Joint	49	51	100	(50.0)
Nuclear	51	49	100	(50.0)
Family size				
Small (3-5)	45	36	81	(40.5)
Medium (6-8)	48	55	103	(51.5)
Large (9 more)	7	9	16	(8)
Caste				
Scheduled Caste	24	60	54	(27.0)
Backward Caste	26	35	61	(30.5)
General Caste	50	35	85	(42.5)
Father's Education				
Illiterate	39	30	69	(34.5)
Primary	18	17	35	(17.5)
Up to 8th	15	15	30	(15.0)
Up to 10th	24	31	55	(27.5)
Up to 12th	4	7	11	(5.5)
Mother's Education				
Illiterate	58	51	109	(54.5)
Primary	22	16	38	(19.0)
Up to 8th	10	14	24	(12.0)
Up to 10th	10	14	24	(12.0)
Up to 12th	10	5	15	(7.5)
Father's Occupation				
Labour	68	49	117	(58.5)
Caste Occupation	23	21	44	(22.0)
Shopkeeper	1	10	11	(5.5)
Service	8	20	28	(14.0)
Mother's Occupation				
Labour	23	46	69	(34.5)
Caste Occupation	1	5	6	(3.0)
Business	-			
House wife	75	42	117	(58.5)
Service	1	7	8	(4.0)
Religion				
Hindu	48	89	137	(68.5)
Muslim	52	11	63	(31.5)
Position of child				
First	31	21	52	(26.0)
Middle	47	47	94	(47.0)
Last	22	32	54	(27.0)
Type of House				
Kaccha	6	11	17	(8.5)
Pacca	94	89	183	(91.5)

Sixty eight per cent of the respondents parents were daily wage labours by their occupation followed by 23 per cent in caste occupation business; 1 percent were engaged in shops and only 8 per cent were in service. In rural area, results showed that higher percentage (49%) of fathers were engaged in labour followed by 21 per cent caste occupation. Ten percent of rural fathers, were shopkeeper while 20 per cent were doing service. Most of the mother were house wifes and were not engaged in any occupation or job. In urban area 75 percent of mother were housewives, followed by 23 per cent daily wage workers and 1% per cent in service and caste occupation. In rural area, the higher percentage (46%) of mother were daily wage workers followed by 42 per cent house wife and 7 per cent in service. The remaining 5 per cent of mother were engaged in caste occupation. Religion was classified in terms of Hindu and Muslim respectively. Hindus were higher percentage (89%) in rural and (48%) in urban and muslim religion were higher in urban (52%) and only 11 per cent rural area. Forty seven percent of urban school children were on middle position followed by first position (31%) and last position (22%) in urban area. Similarly 47% of rural children were on middle position followed by last (32%) and 21 per cent on the first position. Majority of urban (94%) and 89% of rural children were residing in pacca houses while small percentage of urban 6 and 11 percent rural children were residing in Kaccha houses.

Table-2 Mean daily food intake of school children (n=200)

Food Stuffs	Recommended Dietary Intake	Mean daily food Intake	Z value	% of RDI
Cereals	180	172.75 ± 31.12	–3.25**	95.55
Pulses	60	32.64 ± 16.25	–23.75**	53.33
Milk & Milk Products	500	278.13 ± 17.34	–173.49**	55.6
Roots and Tubers	100	41.61 ± 26.42	–31.24**	41.61
Green leafy vegetables	100	32.19 ± 9.58	–99.96**	32.19
Other Vegetables	100	42.78 ± 15.87	–50.90**	42.78
Fruits	100	43.06 ± 7.6	–105.0**	43.06
Sugar & Jaggery	20	17.72 ± 2.54	–12.58**	88.60
Fats & Oil	30	15.18 ± 1.73	–121.03**	50.60

Values are mean ± SD
RDI – Recommended Dietary Intake (ICMR 2010)
Z value shows comparison of food intake with RDI
*Significant at 5% level
**Significant at 1% level

Cereals are the part and parcel of Indian diet and provide energy and several other nutrients at a very low cost. These are the cheapest and widely available source of nutrients, particularly in developing countries like India. Mean daily intake of school going children was 172.75 g which was 95.55 per cent of RDI. The mean daily consumption of pulses was 32.64 g/day which 53.33 per cent of RDI. The mean daily intake of milk and milk products of school going children was 278 g/day which was 55.6 per cent of RDI. The daily mean intake of root and tubers of school going children was 41.61. Green leafy vegetables are rich source of calcium, iron, β-carotene, vitamin C and folic acid. Table 2 revealed that intake of green leafy vegetable of school going children was 32.19 g/day which was significantly ($P \leq 0.01$) lower than RDI. The mean intake of other vegetables of school going children was 42.78 g/day (42% RDI). Fruits are the good source of vitamins and minerals and also contain pectin which provide bulk to the diet. Mean daily intake of fruits was 43.06g which was significantly lower than RDI. Average, consumption of sugar and jaggery among children was 17.72 g/day which was 88.60 percent of RDI and significantly lower than the RDI. The daily mean fat and oils intake of school going children which was 15.18 g (50.60% of RDI).

Conclusion

Mean daily food intake of school going children indicated that they were consuming inadequate amount of pulses, milk & milk products, roots and tubers, green leafy vegetables, other vegetables, fruits, sugar & jaggery, fats & oils. They need to be educated about good food habits and balanced diet to maintain their health and improve nutritional status because they are the future of our country.

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