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Assessment of Dietary Practices Among School-Going Children (7-12 Years) of Selected Private and Goverment. Schools

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ABSTRACT

The present study was undertaken to assess the nutritional status of 7-12 years of school-going children and to determine the nutrient intake in comparison with RDA. A total sample of 120 school-going children was selected from one Govt. and two private schools of Bhubaneswar city, Odisha. A structured questionnaire was used and anthropometric measurements were taken to collect the data. Data on dietary intake were collected by using 24 hours recall method. From the study, it was found that the prevalence of thinness was 58.33% in Govt. school children whereas 28.33% of private school children were overweight and 11.67% were obese. The school-going children of Govt. school were found to be stunted 6.67%. Consumption of all the nutrients by Govt. school children was a deficit from the recommended dietary allowances but in case of private school children, consumption of all the nutrients was excess from the Recommended Dietary Allowances except vitamin-A. Consumption of food items such as egg, fish, meat, milk and milk products, fruits and nuts were found to be lower in case of Govt. school children as compared to private school children. However, the study indicated that undernutrition in Govt. school children may be due to lower intake of food and nutrients than the recommended standard. Deficiency of vitamin-A in the diet was observed in both the schools due to negligible consumption of green leafy vegetables and minimal consumption of other vegetables and fruits.

KEY WORDS: SCHOOL GOING CHILDREN, ANTHROPOMETRIC MEASUREMENT, RDA AND DIETARY INTAKE.

INTRODUCTION

Children being the future wealth of the nation are considered an important segment of the population. Their survival, protection, and development are the prerequisite for the future development of society. The school-age is the active growing phase of childhood and dynamic period of growth when children undergo physical, mental, emotional and social changes. Nutritional intake has a special direct effect on children's health due to their physical and mental growth as well as cognitive development.During this age, children establish habits of their choice in eating, selecting hobbies, sports and performing an exercise that stick with them for their entire lives. The availability of quality food, affordability of family, choice of children etc. is the critical factors contributing to undernourishment and malnutrition.

The prevalence of malnutrition and obesity is significantly higher in India than many other developed and developing countries. Malnutrition is one of the principal public

health problems affecting large sections of populations especially children in developing countries (Begum and Nessa, 2008). Healthy habits of children minimize the risks of many chronic diseases but, physically inactive children with poor eating habits are vulnerable to adverse health conditions during forthcoming adulthood. Good nutrition is an essential component of a healthy life which determines health, physical and mental growth. But, diet is one of the prime determinants of health and nutritional status. Assessment of food quality and quantity through dietary surveys are therefore essential for school children. To educate the school children and their parents for changing food habits, it is needed to collect information on nutritional habits involving the source of foods,associated factors of food consumption and feeding style of the children. Therefore, the present study has been designed to generate information on the assessment of dietary practices among school-going children (7-12 years) of selected private and Govt. schools in Bhubaneswar.

MATERIAL AND METHODS

2.1 Study Design: The study was undertaken in Bhubaneswar city. A total no.of 120 school going children (7-12 years) were selected randomly. Three schools were selected as the study areas namely Rajbhawan Project U.P school (Gopabandhu square), D.A.V Public school(unit-8) and Steward School(CRPF Square) in Bhubaneswar City by using a simple random sampling method.

2.2 Study Population: A total no. of 120 children of 7-12 years old school children (both boys and girls) were selected. Out of 120 samples, 60 childrenfrom Govt. School and another 60 from private school were taken.

2.3 Data Collection Procedure: A semi-structured questionnaire was used to collect the desired information regarding the socio-demographic profile ofthe child, anthropometric measurement and dietary information.

2.4 Anthropometric Measurement: Nutritional status of all the selected children was assessed by measuring body heights (cm) and weights (kg). The anthropometric assessment was conducted to identify children with moderate to severe undernutrition. Two indices were taken as a measure of chronic undernutrition i.e. BMI-for –age (thinness) and height -for -age (stunted) with reference to WHO standard,2007.

Weight: A bathroom scale weighing machine was used for taking weight measurement of girls and boys. Every time before taking measurement zero error was checked and data were recorded.

Height: The child was made to stand with feet flat together against the wall with legs straight, arms at sides, and shoulders at a level and removes their footwear. Mark was made where the bottom of the headpiece meets the wall. Then by using a measuring tape height was measured from the base on the floor to the wall to the nearest 0.1 centimetres.

Table 3.1. Socio-demographic profile of the school-going children N=120

Sl. No.	Variables	Categories	Govt. School (n=60)	Private School (n=60)
01	Age			
	7-9yr.	30 (50.00)	30 (50.00)	
		10-11 yr.	30 (50.00)	30 (50.00)
02	Type of family	Nuclear	21 (35.00)	42 (70.00)
		Joint	39 (65.00)	18 (30.00)
03	Caste General	7 (11.67)	53 (88.34)	
		OBC	39 (65.00)	2 (3.33)
		SC	10 (16.67)	5 (8.33)
		ST	4 (6.66)	-
04	Socio-economic status Upper	-	21 (35.00)	
		Upper middle	2 (3.33)	39 (65.00)
		Lower middle	21 (35.00)	-
		Upper lower	37 (61.67)	-

Figures in the parenthesis indicate per cent value

2.5 Diet survey: In recalling foods consumed by the child in the past 24-hours, asked to indicate the time and source of the food (whether purchased, home-made, or school-meal) for each eating event. Standardised cups were used to estimate the quantities of foods consumed. From the raw ingredients' amounts, the nutritive value of each food item was calculated by using the nutritive values given by C. Gopalan (1989). It was compared with Recommended Dietary Allowances (RDA) of nutrients for

those of specific age groups. It was recorded in terms of cereals & millets, pulses and legumes, green leafy vegetables, roots and tubers, other vegetables, fruits, milk and milk products, egg,fish, meat, sugar and jaggery, nuts and oilseeds. The nutrient value of calorie, protein, CHO, fat, calcium, iron and vitamin-A were computed by using the nutritive value of Indian foods (C.Gopalan, 1989). The RDA value(2010) was also taken into consideration for comparing the values.

Statistical Analysis: Data entry and analysis was done by using SPSS software version 20.0. Anthropometric indices were calculated using the 2007 WHO Anthro 3.2.1 Software. Descriptive analysis was used to describe the percentages and frequency of sociodemographic characteristics and other relevant variables in the study. t-test was used to test the difference between two population means based on two sample means.

RESULTS AND DISCUSSION

The data obtained were analyzed for the stated objectives. A total sample of 120 children aged 7-12years was selected for the present study. Out of total children, 50.00% were taken from Govt. school and 50.00% from the private school.

The socio-demographic profile of children between the age group of 7-12 years was presented in Table3.1. The majority of children (70.00%) from private school belonged to a nuclear family whereas 65.00 %of children from Govt. school were from joint family. Out of total children from the private school, the majority were from general caste category (88.34%) followed by SC (8.33%) and OBC (3.33%). In Govt. school, the major category of children was from OBC (65.00%) followed by SC (16.67%), general (11.67%) and ST (6.66%). The study revealed that all children of private school belonged from upper (35.00%) and upper-middle class (65.00%) category whereas Govt. school children were from upper-middle (3.33%), lower-middle (35.00%) and upper-lower (61.67%).

Anthropometric measurement of children:

Table 3.2. Nutritional status according to BMI-for-age N=120

Nutritional Status	WHO Indicator	Govt. School (n=60)	Private School (n=60)
Thinness	≤ -2S.D	35 (58.33)	-
Normal	≥ 1S.D to -2S.D	25 (41.67)	36 (60.00)
Overweight	≥ +1S.D	-	17 (28.33)
Obesity	≥ +2S.D	-	7 (11.67)

Table 3.3. Nutritional status according to height-for-age N=120

Nutritional Status	WHO Indicator	Govt. School (n=60)	Private School (n=60)
Stunting	≤ -2S.D	4 (6.67)	-
Normal	≥ -2S.D	56 (93.33)	60 (100.00)

Table 3.4. Age-wise anthropometric measurement of Govt. and private school children N=120

Age group	Parameters	Govt. School (n=60)	Private School (n=60)	t-value
7-9 yrs.	Height (cm.)	121.53±6.68	125.5±8.54	2.002**
	Weight (kg.)	24.8±3.75	35.93±5.68	8.946**
10-12yrs.	Height (cm.)	137.43 ±9.40	138..63 ±12.10	0.428 (NS)
	Weight (kg.)	33.33±6.11	42.4±7.93	4.955**

The nutritional status of school children according to BMI-for-age was presented in Table-3.2. The school-going children of Govt. school were found to be thinness and normal category i.e. 58.33% and 41.67% respectively. No children were found in the overweight and obese category in Govt. school, but in private school, 60.00% children were in the normal group followed by overweight (28.33%) and obese (11.67%). Thinness was not observed among children belonged from the private school. A similar study was also conducted in the Western Region of Nepal. The study revealed that out of 786 students, 26.00% of the students were found to be undernourished (Joshi. et al., 2011). In the other hand, the private school children were an estimated 19.9% for under-nourished, 10.2% for overweight and 5.7% for obese categories (Ganganahalli. et al., 2016).

The nutritional status of school children according to height-for-age was presented in Table-3.3. The school-going children of Govt. school were found to be stunted and normal group i.e. 6.67% and 93.33% respectively. But in private school, all children (100.00%) were in the normal group and stunting was not found in children from the private school. Out of 253 children, 28.8% were in underweight, 19.4% stunting and 17.8% in wasting in Panchakula city, Haryana (Talwar. et al., 2015). Further, a study was carried out amongst 558 school children aged 3-16 years in Ghaziabad city reported that 59(10.5%) were stunted (Garg.et al., 2015). In the present study, it was observed that the children from Govt. school were compelled to avail low-quality nutrition and remain undernourished due to their lower family income.

The mean anthropometric measurement of Govt. and private school children were presented in Table-3.4. Under the age group of 7-9 years, the mean height (121.53±6.68) and (125.5±8.54) and weight (24.8±3.75and 35.93±5.68) of Govt. and private school children varied significantly (p<0.01) where higher values were measured for private school children than those for Govt. school. Similar results with significant variation (p<0.01) were observed for weight (33.33±6.11 and 42.4±7.93) in Govt. and private school children leaving the variation of height non-significant under the age group of 10-12 years.

The study was also in line with the mean height and weight of 7-10 years of school-going children of Allahabad district were significantly (p<0.05%) less than the National Centre for Health Statistics standards (Handa. et al., 2008). The findings of the present study resemble with the aforesaid reports. Observation of high values for height and weight in private school children may be attributed due to higher nutritional status of the family based on the socio-economic background of private school parents. On the other hand, the general lower economic standard of the parents of Govt. school, may not maintain the recommended nutritional standard for their children for which the growth factors are adversely affected.

Diet and nutrient intake: Table-3.5 revealed that all the children (100%) of both schools consumed cereals on daily basis. Govt. school children consumed pulses daily (31.67%) and 4-6 times in a week (23.33%) whereas 61.67% and 38.33% children from Govt. school consumed pulses on daily basis and 4-6 times in a week respectively. No children of Govt. and private school consumed green leafy vegetables, egg, fish and meat on daily basis. Intake of pulses, root and tuber, other vegetables are consumed more daily by private school children as compared to Govt. school children. Majority of private school children consumed milk and milk products daily but very few children of Govt. school consumed milk and milk products daily. The low consumption of costly food items such as egg, fish, meat, fruits and nuts for 4-6 times in a week by Govt. school children as compared to private school children. The present study was also in line with (David. et al., 2012) which revealed that low consumption of high-quality protein from meat, eggs, margarine, fish and oils and African leafy vegetables by the school-going children in Machakos district was the reason for poor anthropometric and nutritional status.

Table 3. 5. Food consumption pattern by school children N=120

	Govt. school F(%)	Private school F(%)	Govt. school F (%)	Private school F (%)	Govt. school F (%)	Private school F (%)	Govt. school F (%)	Private school F (%)
Cereals	60 (100.0)	60 (100.0)	-	-	-	-	-	-
Pulses	19 (31.67)	37 (61.67)	41 (23.33)	23 (38.33)	-	-	-	-
Green leafy vegetables	-	-	7 (11.67)	12 (20.00)	30 (50.00)	26 (43.33)	23 (38.33)	22 (36.67)
Root and tubers	30 (50.00)	49 (81.67)	27 (45.00)	7 (11.67)	27 (45.00)	7 (11.67)	-	-
Other vegetables	18 (30.00)	44 (73.33)	23 (38.33)	12 (20.00)	16 (26.67)	4 (6.67)	3 (5.00)	-
Fruits	-	23 (38.33)	4 (6.66)	18 (30.00)	18 (30.00)	28 (46.67)	28 (46.67)	-
Milk and milk product	10 (16.67)	50 (83.33)	-	-	18 (30.00)	10 (16.67)	32 (53.33)	-
Egg	-	-	4 (6.67)	38 (63.33)	48 (80.00)	22 (36.67)	8 (13.33)	-
Fish	-	-	25 (41.66)	37 (61.67)	28 (46.67)	21 (35.00)	7 (11.67)	2 (3.33)
Meat	-	-	6 (10.00)	21 (35.00)	36 (60.00)	33 (55.00)	18 (30.00)	6 (10.00)
Sugar &jiggery	30 (50.00)	33 (55.00)	23 (38.33)	22 (36.67)	7 (11.67)	5 (8.33)	-	-
Nuts & oil seeds	-	16 (26.67)	-	17 (28.33)	15 (25.00)	24 (40.00)	45 (75.00)	3 (5.00)

Around half of the children from both Govt. and private school consumed sugar and jaggery on daily basis. The consumption of cereals, pulses and fat-based foods in excess and vegetables and fruits in a deficient manner were the reason for obesity in school going children of Western Maharashtra (Kamble. et al., 2016). However, all the school going children belonging to Trans Yamuna Region of Allahabad consumed cereals, pulses, sugar, fats and oils daily (Perween., 2018). Among private school children (7-12 yrs), the nutrient intake was significantly higher (p<0.01) than those of Govt. school children but, in case of Govt. school children, it was less than the RDA value.

Table 3.6. Average daily nutrient intake* of children (7–9 yr.) boys N=30

Nutrients intake	RDA value	Children from Govt. School (n=15)	Children from Private School (n=15)	t-value
Energy (Kcl)	1690	1543.23±114.44	1906.73±301.36	4.367**
Protein (gm)	29.5	26.70±3.0	33.70±3.05	6.333**
CHO (gm)	253	238.79±47.22	286.93±18.26	3.394**
Fat (gm)	30	27.16±3.14	36.30±3.37	7.669**
Calcium (mg)	600	510.36±85.78	630.36±43.08	4.841**
Iron (mg)	16	14.17±2.22	16.50±2.15	3.373**
Vitamin-A (µg)	4800	2556.79±615.09	4195.34±595.78	7.410**

Figures were presented as (Mean± SD)
'**'denotes significant variation (p<0.01) between columns
'*' denotes Nutritive value of Indian foods

Table 3.7. Average daily nutrient intake* of children (7–9 yr.) girls N=30

Nutrients intake	RDA value	Children from Govt. School (n=15)	Children from Private School (n=15)	t-value
Energy (Kcl)	1690	1536.56±86.02	1883.23±141.88	8.091**
Protein (gm)	29.5	26.71±2.23	33.37±1.90	9.365**
CHO (gm)	253	240.13±45.72	284.61±27.39	3.232**
Fat (gm)	30	27.09±3.04	35.97±2.34	8.943**
Calcium (mg)	600	512.79±87.12	627.02±68.11	4.177**
Iron (mg)	16	14.25±1.95	16.19±2.02	2.601**
Vitamin-A (µg)	4800	2541.74±651.52	4128.48±682.19	6.676**

Figures were presented as (Mean± SD)
'**'denotes significant variation (p<0.01) between columns
'*' denotes Nutritive value of Indian foods

Table 3. 8. Average daily nutrient intake* of children (10–12 yr.) boys   N=30

Nutrients intake	RDA value	Children from Govt. School (n=15)	Children from Private School (n=15)	t-value
Energy (Kcl)	2190	1992.90±134.67	2420.40±119.16	9.207**
Protein (gm)	39.9	36.29±2.57	45.85±2.57	10.165**
CHO (gm)	328.5	286.11±53.78	370.83±17.74	5.793**
Fat (gm)	35	31.87±11.41	41.61±3.37	3.169**
Calcium (mg)	800	683.83±119.51	824.30±121.01	3.198**
Iron (mg)	21	18.65±2.40	21.71±1.23	4.384**
Vitamin-A (µg)	4800	2510.12±657.42	3963.45±669.53	5.998**

Figures were presented as (Mean± SD)
'**'denotes significant variation (p<0.01) between columns'*'
denotes Nutritive value of Indian foods

The intake of energy, protein, CHO, fat, calcium, iron and vitamin-A by the children of Govt. school was a deficit for RDA as per the recommendation suggested by ICMR. On the other hand, the consumption of energy, protein, CHO, fat, calcium and iron by private school children were adequate and Vitamin-A was deficit basing on RDA of ICMR. The mean nutrient intake per day as well as how much this varies from the RDA can be seen in Table -3.6, 3.7,3.8 and 3.9. The intake of protein, energy, calcium, iron, carotene, thiamine, riboflavin and niacin was lower and fat and ascorbic acid was more than the RDA in 7-9 years of school-going children of Himachal Pradesh (Soni. et al., 2014).

Table 3.9. Average daily nutrient intake* of children (10-12 yr.) girls N=30				
Nutrients intake	RDA value	Children from Govt. School (n=15)	Children from Private School (n=15)	t-value
Energy (Kcl)	2010	1828.65±80.19	2268.48±123.69	11.555**
Protein (gm)	40.4	36.11±3.33	45.04±3.65	6.996**
CHO (gm)	301.5	285.16±37.96	340.76±31.84	4.345**
Fat (gm)	35	31.96±5.23	41.96±4.24	5.746**
Calcium (mg)	800	685.00±124.44	821.70±100.59	3.308**
Iron (mg)	27	23.49±3.42	27.84±4.78	2.868**
Vitamin-A (µg)	4800	2508.57±969.02	4071.14±716.68	5.021**

Figures were presented as (Mean± SD)
'**'denotes significant variation (p<0.01) between columns
'*' denotes Nutritive value of Indian foods

The obese school-going children in Western Maharashtra were observed for excess energy and protein and deficit vitamins and minerals consumption (Kamble. et.al, 2016). Consumption of all the nutrients by the majority of the students (10-12 years) was comparatively less than the recommended dietary allowances (Handa. et al., 2008). The children of private school take comparatively better quality food than those in Govt. school. Therefore, in the present study adequate rate of energy, protein, CHO, fat, calcium, and iron consumption was observed in private school children. But, the deficit of vitamin-A may be due to less incorporation of fruits and vegetables rich in vitamin-A in the diet.

CONCLUSION AND RECOMMENDATION

The present study revealed that out of total children, the prevalence of thinness was 58.33% in Govt. school children whereas 28.33% of private school children were overweight and 11.67% were obese. The school-going children of Govt. school were found to be stunted (6.67%). Under the age group of 7-9 years, the mean height and weight of Govt. and private school children varied significantly (p<0.01) whereas higher values were measured for private school children than those for Govt. school. Similar results with significant variation (p<0.01) were observed for weight in Govt. and private school children leaving the variation of height non-significant under the age group of 10-12 years.Govt. school children were found undernourished (thinness and stunting) than the children of private school because the children studying in Govt. school belong to lower socio-economic condition whereas private school children belong to upper socio-economic condition, they consumed fatty foods and were found normal to obese.In general negligible consumption of green leafy vegetables and minimal consumption of other vegetables and fruits due to which their diet deficient in vitamin-A were observed in the children of both schools.

However, more studies on large population are needed to understand the alarming threats of child obesity, overweight, underweight, malnutrition anddifferent types of nutrient deficiency diseases. To enhance the quality of eating of children from high and low socioeconomic strata by imparting nutrition education at school course curriculum. Especially, mothers should be educated about the importance of balanced diet, the right choice of foods, limiting junk foods consumption, nutrient conservation by proper cooking methods, utilization of seasonal foods to ensure foodand nutritional security.

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