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Assessment of Deficiency of Trace-Element and Micro-Nutrients and Impact of Socio- Economic Status on Dietary Habit of “10-14” Years Adolescence

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ABSTRACT: Micronutrient deficiencies affect more than two billion people of all ages in both developing and industrialized countries. They are the cause of some diseases, exacerbate others and are recognized as having an important impact on worldwide health. A cross sectional study was carried out to assess the nutritional status of adolescent girls and boys of Kanpur district. The objective of the study was to determine the impact of socio-economic status on dietary habit of adolescence. This study was conducted among 4-schools using general information, anthropometric, clinical information, dietary intake information and food habits. The study comprised of 150 adolescence boys and girls between the age group of 10-14 years of age. Data was analyzed using percentage, Arithmetic mean, standard deviation and Chi square test was applied to test the strength of association between the variables. Maximum 65.3% boys and 53.3% girls were belonged to 10-12 years age groups while 34.7% boys and 46.7% girls were belonged to 13-14 years age groups. Iron, zinc and dietary folate deficiency are the common health problems among adolescent girls. Adolescence were more aware about nutrition and their effect on health so approximately all the adolescent boys and girls were ensuring optimum amount of taking nutrients as prescribed by recommended dietary allowance value.

KEYWORDS: Food habits, micro-nutrients, adolescent boys and girls, nutritional status

I. INTRODUCTION

Micronutrient deficiency or dietary deficiency is a lack of one or more of the micronutrients required for plant or animal health. In humans and other animals they include both vitamin deficiencies and mineral deficiencies, whereas in plants the term refers to deficiencies of essential trace minerals. Important micronutrients include iodine, iron, zinc, calcium, selenium, fluorine, and vitamins A, B₆, B₁₂, B₁, B₂, B₃ and C. Deficiencies of essential vitamins or minerals such as Vitamin - A, iron and zinc may be caused by long-term shortages of nutritious food or by infections such as intestinal worms. They may also be caused or exacerbated when illnesses (such as diarrhea or malaria) cause rapid loss of nutrients through feces or vomit.

The micronutrients perform essential functions in normal growth and development beginning in the earliest stages of life. These essential micronutrients fulfill a variety of special metabolic functions, some acting as co-factors or co-substrates for in the metabolism of proteins and amino acids, lipids and/or carbohydrates and in energy production and others serving as the catalytic centers or as structural elements of enzymes or other macro molecules. These micronutrients can not be synthesized by humans, they must be obtained from the diet. Micronutrient malnutrition can result not only from inadequate access to our

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intake(s) of one or more of these factors, but also from their inadequate digestion, absorption or post-absorptive utilization. Micronutrient deficiencies can also results from pathological processes.

Trace elements are micronutrients required in the body for its normal function especially through various enzymes, hormones, vitamins etc. where they are the important components among them iron, zinc, copper and cobalt are prominent. Deficiency of each one gives rise to specific clinical feature. Besides iron deficiency causing anemia, zinc deficiency causes skin changes, copper deficiency hair changes, cobalt deficiency vitamin B₁₂ deficiency and selenium deficiency may cause cardiomyopathy. (Tarun Kumar Dutta et al., 2012)

Therefore, the present survey was carried out to assess the prevalence of common micronutrient deficiencies among the vulnerable groups of urban population covering statistically adequate sample in each of the areas of Kanpur city, Uttar Pradesh.

II. OBJECTIVE

To assess the 24 hour dietary recall of respondents.

III. METHODOLOGY

A cross sectional study was carried out to assess the nutritional status of young girls and boys of Kanpur district. A total of 150 adolescent girls and boys of 10 to 14 years of age, living in the kalyanpur area of Kanpur district of Uttar Pradesh state were selected at randomly as sample. Out of them, 75 were girls and 75 were boys. The socio-demographic data were elicited by administering the pretested questionnaire and anthropometric measurements such as height, weight, waist and hip circumference were recorded by following standard methods and clinical methods. The indirect method used was diet survey; the 24 hours recall method, food habits and dietary intake information.

IV. RESULT

Table 4.1 Distribution of respondents according to parental occupation

Parental Occupation	Boys		Girls	
	N	%	N	%
Agriculture	15	20	10	13.4
Labor	5	6.6	13	17.3
Business	10	13.4	16	21.3
Government Job	30	40	22	29.4
Private Job	15	20	14	18.6
Total	75	100	75	100
χ^2	0.013			

Table 4.1 reveals that distribution of respondents according to parental occupation. The parents of 20 % boys and 13.4 % girls were belonged to agriculture occupation, 6.6 % boys and 17.3 % girls were belonged to labor parental occupation, 13.4 % boys and 21.3 % girls were belonged to Business parental occupation whereas most of the parents of boys and girls were engaged in Government job as 40 % and 29.4 % respectively and parents of 20 % boys and 18.6

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% girls were engaged in private job respectively. The observe value of χ^2 was fond to be non-significant at 5% level of significance.

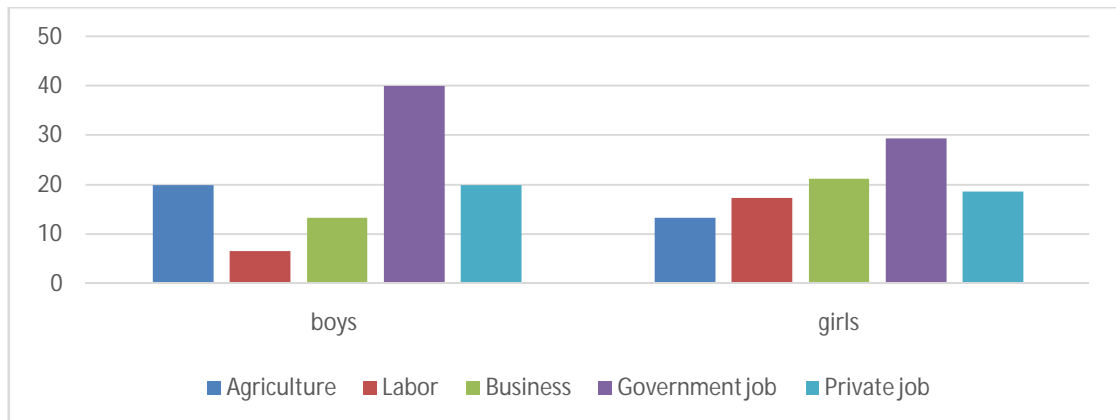
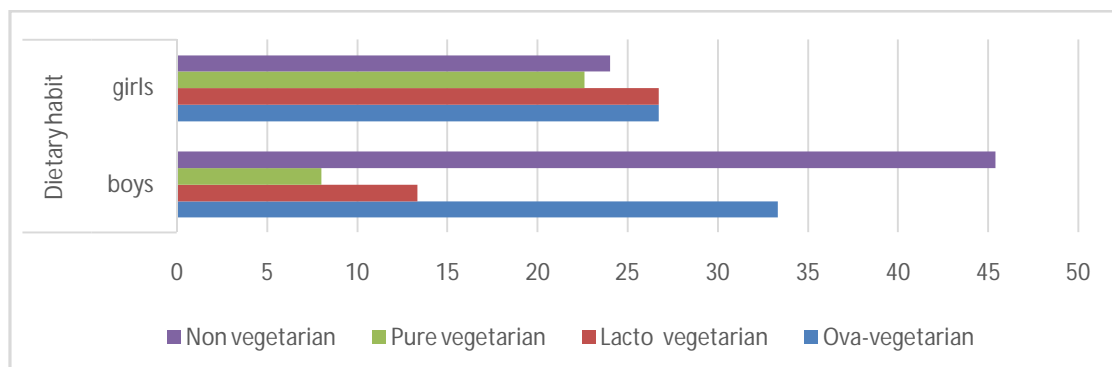


Table 4.2 Distribution of respondents according to dietary habit

Dietary habit	Boys		Girls	
	N	%	N	%
Ova-vegetarian	25	33.3	20	26.7
Lacto-vegetarian	10	13.3	20	26.7
Pure vegetarian	6	8	17	22.6
Non vegetarian	34	45.4	18	24
Total	75	100	75	100

Table 4.2 reveals distribution of respondents according to dietary habit. Maximum boys were non-vegetarian i.e. 45.4%, 33.3 % were ova vegetarian, 13.3 % were lacto vegetarian, and 8% were pure vegetarian. Similarly maximum girls were ova and lacto vegetarian i.e. 26.7 % in both categories. 24 % of girls were non vegetarian and 22.6 % of girls were pure vegetarian accordingly.



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Table 4.3 Distribution of respondents according to taking any additional food item

Additional Food Item	Boys		Girls	
	N	%	N	%
Fruits	15	20	20	26.6
Chips	29	38.7	45	60
Sweets	24	32	8	10.7
Any Other	7	9.3	2	2.7
Total	75	100	75	100

Table 4.3 reveals that respondents taking fruits, chips, sweets and any other additional food item. According to this table, boys had taken more chips & sweet items i.e. 38.7% and 32 % whereas girls were more likely to eat chips and fruits i.e. 60 % and 26.6 % respectively. 20 % boys had taken fruits & the rest were of 9.3 % who had taken any other additional food item. 10.7 % girls were likely to prefer sweet item & the rest 2.7 % of girls had taken any other additional food item.

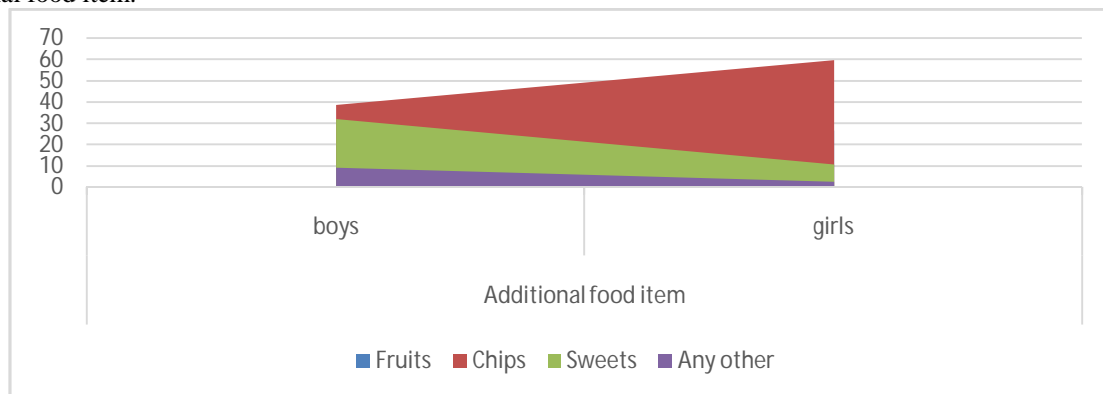


Table 4.4 Distribution of respondents according to drinking milk daily

Drinking milk daily	Boys		Girls	
	N	%	N	%
Yes	66	88	71	94.6
No	9	12	4	5.4
Total	75	100	75	100

Table 4.4 reveals that maximum 88 % boys and 94.6 % girls were aware about drinking milk daily whereas 12 % boys and 5.4 % girls were not taken milk on daily basis.

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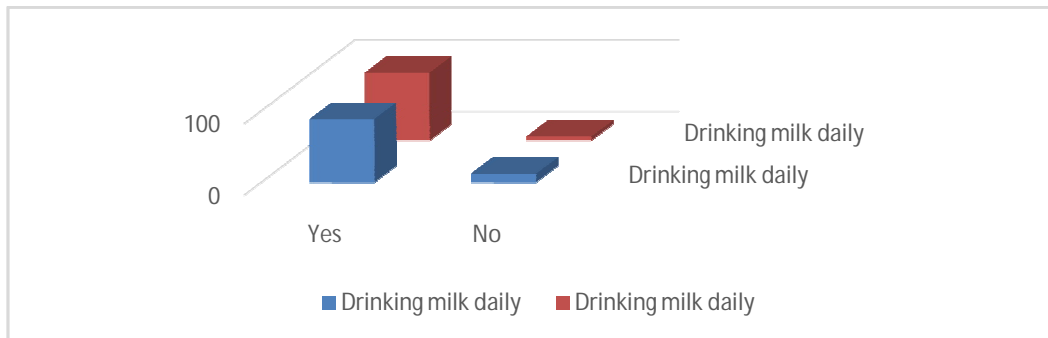


Table 4.5 Distribution of adolescence (10-12 yrs.) according to per day mean nutrient intake

Age	Nutrients	RDA	Boys		RDA	Girls	
			Mean	% deficit		Mean	% deficit
10-12 Years	Energy (kcal)	2190	2247.5	-2.62	2010	2208.09	-9.85
	Protein (gm)	39.9	66.38	-66.38	40.4	62.12	-53.76
	Fat (gm)	35	54.91	-56.88	35	65.70	87.71
	Iron (mg)	21	23.20	-2.43	27	27.91	-3.37
	Zinc (mg)	9	9.49	-5.44	9	9.23	-2.55
	Vitamin- C (mg)	40	54.71	-36.77	40	55.21	-38.02
	Dietary folate (µg)	140	142.44	-1.74	140	138.79	0.86

The 24 hour dietary recall was used to find out the amount of essential nutrients intake by the respondents. The average intake of nutrients with the RDA and percentage deficit or increase is given here.

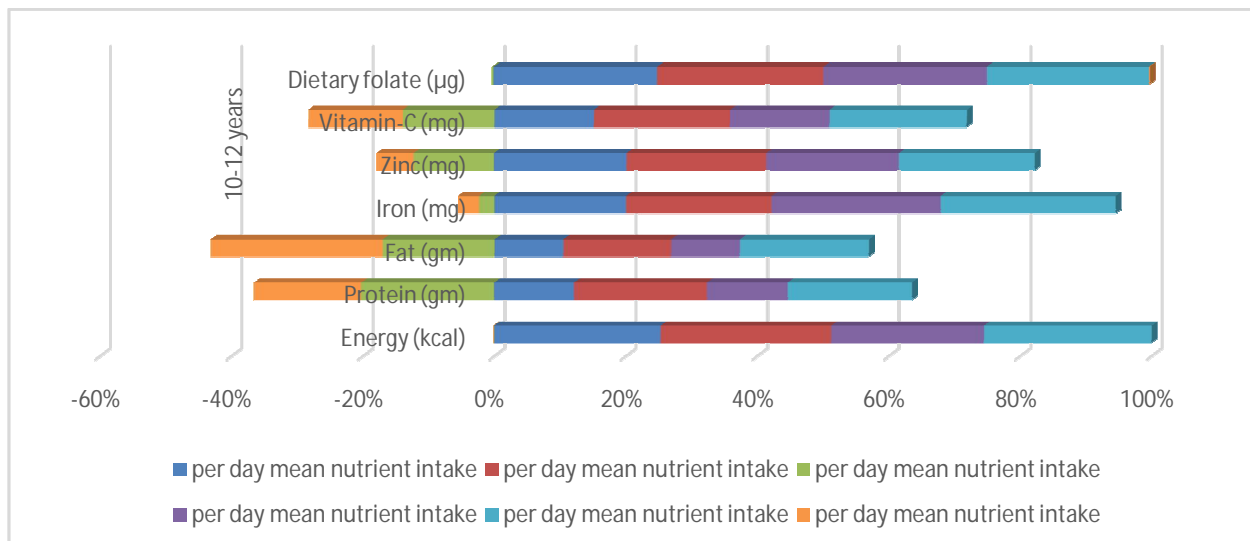
Table 4.5 shows that in adolescent boys of 10-12 years, the highest average energy intake was 2247.50 kcal/day and that of girls of same age group was 2208.09 kcal/day, the highest average protein intake was 66.38 gm/day and that of girls of same age group was 62.12 gm/day, the highest average fat intake was 54.91 gm/day and that of girls of same age group was 65.70 gm/day, the highest average iron intake was 23.20 mg/day and that of girls of same age group was 27.91 mg/day, the highest average zinc intake was 9.49 mg/day and that of girls of same age group was 9.23 mg/day, the highest average Vitamin-C intake was 54.71 mg/day and that of girls of same age group was 55.21 mg/day, the highest average folic acid intake was 142.44µg/day and that of girls of same age group was 138.79 µg/day which was least than RDA value.

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V. DISCUSSION

Respondents were asked to report everything that they had to eat or drink on the previous day. At the end of the recall, respondents were invited to add any additional items not initially recalled. For each item of food or drink, respondents were asked to provide additional detail. a) The time at which the food or drink was consumed. b) A full description of the food or drink, including brand name where available. c) Any foods likely to be eaten in combination e.g. milk in coffee d) Recipes and other combinations of foods e.g. chips or sweets e) The quantity consumed, based on household measures, photographs of different portion sizes of foods or weights. f) Any leftovers or second helpings. The interviewer reviews all the food eaten and drunk in chronological order, prompts for any additional eating or drinking occasions or foods/drink possibly consumed and clarifies any ambiguities regarding type of food eaten or portion size.

VI. CONCLUSION

The present study showed that parental occupation of the adolescence was quite good and does not affect the dietary pattern of adolescents. Maximum boys were non-vegetarian and maximum girls were ova and lacto vegetarian respectively. Maximum boys and girls were taking milk daily. They were also taking additional food items which gave them empty calories and unwanted fats. Per day mean nutrient intake of almost all nutrients were higher than RDA except folic acid in girls which was lesser than RDA.

A healthy diet throughout puberty and adolescence is important to provide nutrients that support optimal physical growth and cognitive development. Although it is generally advised that micronutrients should be obtained from food, many adolescents do not reach daily intake recommendations for select micronutrients from diet alone.

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