Effect of socio-economic status on dietary and nutrient intakes of adolescent girls of Patna, Bihar

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■ **ABSTRACT :** Adolescence is a period of rapid growth accompanied by major physical changes which require extra nutritional intake of nutrients such as carbohydrates, protein, fat, vitamin and minerals. Adolescent girls are a very important segment of population as they are the potential mothers of future generations. Socio-economic status of adolescent girls has a bearing on their dietary and nutrient intake. The present survey was conducted to assess the variation in food and nutrient intake among the adolescent girls of low, middle and high income groups residing in the jurisdiction of Patna Municipal area. Standard methods of dietary and nutrition survey were used to collect the information. The results were compared with RDA given by ICMR across different income levels of the adolescent girls. The study revealed that the adolescent girls as a whole have a poor intake of food in terms of quality and quality irrespective of their socio-economic status. However, intake of certain food and nutrients varied among girls coming from different socio-economic groups.

■ **KEY WORDS :** Recommended dietary allowances (R.D.A.), Socio-economic status, Nutrient intake, Food intake

Socio-economic status plays a vital role on the variation in consumption of foods and nutrients. It is worth to verify the factors associated with the variation in dietary pattern and nutrient adequacies. Roos (2000), in his study found that, those of higher socio-economic status seem to have a healthier overall diet and socio-economic differences have persisted during this time period, even though the consumption pattern and composition of the diet have changed. Thimmayamma *et al.* (1982) reported that, in different population groups of urban and rural Hyderabad, socio-economic differences have an influence on the diet and nutrient intake of pre-school children, school age and adolescent and adults. No sex differences were observed except in adults. Pralhad Rao *et al.* (1986) observed that, the dietary and nutritional status of urban population groups exhibited a clear cut socio-economic differential with HIG (high income group) showing higher level of nutrient consumption and better nutrition profile than the other groups.

Adolescent girls are very important segment of our society as they are our potential mothers and future homemakers. Adolescence is a period of rapid growth when young people acquire new capacities and physical changes with many new characteristics that create not only opportunity for their progress but also create problems for their health and well being, if they are not taken care of. During this period, the growth is accelerated by major physical changes in both boys and girls. The rapid growth during adolescence demands extra nutritional requirements. They need adequate nutritional intake of carbohydrate, protein, fat, vitamin and minerals (Gopalan *et al.*, 2000).

Objective :

To study the socio-economic status and its effect on dietary and nutrient intake of adolescent girls.

■ RESEARCH METHODS

Three hundred adolescent girls of 12 to 18 years age group belonging to different income groups were selected

by random sampling method from 9 Government Colleges and 6 Government girls' schools within the jurisdiction of Patna municipal area. Twenty adolescent girls each were randomly selected from each of these identified colleges and schools. The adolescent girls were classified as belonging to low ;middle and high income groups according to their monthly family income in rupees up to 10000; 10001-20000 and 20001 and above, respectively. Information on socio-economic status was based on the schedule adopted by HUDCO regional office, Patna (2010).

■ **RESEARCH FINDINGS AND DISCUSSION**

The data were collected with the help of schedule through interview regarding intake of food and food consumption pattern of the respondents. Standard household measures including containers of five consecutive sizes, spoons and glasses were shown to the subjects to help them to indicate exact amount of food consumed by them. Dietary survey was carried out by 24 hour recall method. Mean daily intake of different food groups was calculated and compared with balanced diet given by NIN. After obtaining the quantities of different raw foods consumed by the individuals, the nutrients were calculated using the table of "Nutritional values of Indian foods". The nutrients calculated were energy, protein, fat, calcium, iron , vitamin A, thiamin, riboflavin and vitamin C and results were compared with RDA (Recommended dietary allowances) given by ICMR (Indian Council of Medical Research, 1999). Simple arithmetic mean with standard deviation was calculated to interpret the results. The Normal test of significance of

Table 1 : Distribution of adolescent girls according to socio-economic group

Socio-economic status	No. of adolescent girls	Percentage
Low income group	63	21
Middle income group	80	26.7
High income group	157	52.3
Total	300	100

Table 2 : Mean food intake of adolescent girls according to different income groups

Food items	Low income group (n=63)			Middle income group (n=80)			High income group (n=157)			Total (n=300)			RDA (g)*
	Mean	S.D.	'Z' value	Mean	S.D.	'Z' value	Mean	S.D.	'Z' value	Mean	S.D.	'Z' value	
Cereals(g)	275.24	47.56	-4.13*	270.90	66	-3.94*	271	55.66	-6.53*	271.87	56.92	-8.56*	300
Pulses(g)	72.22	30.94	3.14*	77.63	37.52	4.20*	73.79	40.20	4.30*	74.48	37.65	6.66*	60
Roots and tubers (g)	136.19	50.89	5.65*	136.75	65.19	5.04*	118.98	66.58	3.57*	127.33	63.64	7.44*	100
Green leafy vegetables (g)	51.45	15.87	-24.28*	84.94	38.13	-3.53*	41.37	12.74	-57.66*	50.88	20.17	-42.18*	100
Other vegetables (g)	204.13	102.54	8.06*	225.75	92	12.26*	212.13	103.71	13.55*	214	100	19.75*	100
Fruits (g)	9.4	2.22	-323.93*	45.49	23.13	-21.08*	92.92	55.67	-1.59	74.55	35.77	-12.32*	100
Milk(g)	174.60	51	-50.64*	196	84	-32.37*	200	90	-41.77*	188	86	-62.84*	500
Oils and fats(g)	26.56	6.7	1.85	28.78	8.58	3.940*	29.49	8.88	6.34*	28.68	8.44	7.55*	25
Meat and fish (g)	39.45	10.95	-7.65*	38.79	8.75	-11.46*	61.64	19.11	7.63*	46.63	14.53	10.55*	50
Eggs (g)	14.74	3.81	-73.46*	-	-	-	34.49	11.85	-16.400*	26.33	7	-58.57*	50
Sugar and jaggery (g)	16.51	15.10	-7.09*	18.68	15.13	-6.69*	16.27	16.25	-10.587*	16.96	15.70	-14.39*	30

*ICMR , NIN, Hyderabad, (1999), * Indicate significance of value at P= 0.001

Table 3 : Mean nutrient intake of adolescent girls according to different income groups

Nutrients	Low income group (n=63)			Middle income group (n=80)			High income group (n=157)			Total (n=300)		RDA *	'Z' value
	Mean	S.D.	'Z' value	Mean	S.D.	'Z' value	Mean	S.D.	'Z' value	Mean	S.D.		
Energy (k. Cal.)	1736	304	-8.46*	1816	283	-7.71*	1835	328	-8.60*	1809.56	313.31	2060	-13.85*
Protein (g)	56.37	12	-4.39*	61.05	14.30	-1.22	63.80	16.81	0.60	61.51	15.49	65	-1.67
Fat (g)	30.64	9.7	7.070*	40	15.63	10.30*	38.89	14	15.12*	37.47	14.16	22	18.92*
Calcium (mg)	547.67	292	1.30	558	247	2.10***	567	242	3.47*	561.26	254.20	600	4.17*
Iron (mg)	22.39	18.83	-3.21*	22	22.11	-3.24*	22	14	-7.16*	22.36	17.55	30	-7.54*
Vitamin A (µg)	672.71	377.46	1.53	771.23	412.78	3.71*	928.11	610.66	6.73*	832.64	529.44	600	7.61*
Thiamin (mg)	2.55	.85	14.47*	2.79	.81	19.77*	2.79	.81	27.69*	2.74	0.82	1	36.75*
Riboflavin (mg)	1.53	.67	3.91*	1.74	.78	6.19*	1.79	.82	9.02*	1.73	0.79	1.2	11.62*
Vitamin C (mg)	106.25	42.76	12.30*	109.98	32.44	19.30*	110.78	44.76	19.81*	109.62	41.30	40	29.20*

* Nutritive value of Indian foods, NIN, Hyderabad, (2000), *, ** and *** Indicate significance of value at P= 0.001, 0.01 and 0.05, respectively

difference was used to test the difference between mean food intake and nutrient intake according to R.D.A.

Socio-economic status of girls was determined based on the schedule adopted by HUDCO Regional office, Patna (2010). The distribution pattern of students on the basis of the monthly income of the family in Table 1 revealed that 21 per cent of the students came from the low income group family (up tp Rs.10000 per month) whereas 26.7 % belonged to middle income group (Rs. 10001 - 20000 per month) and the majority (52.3 %) belonged to high income group (Rs. 20001 - above per month). Thus, more than half of the respondent girls came from families of high income group *i.e.* having better socio-economic status.

The mean food intake of adolescent girls is presented in Table 2. The pattern of food consumption is different between low, middle and high income groups. It is inferred from the table that the mean intake of rice, wheat and other cereals was significantly lower in families of high income group than in those of low income groups. The intake of qualitative food such as milk and milk products, pulses and legumes, fruits increased significantly with increase in monthly income. The other vegetables, meat and fish and egg, sugar, fats and edible oils and condiments and spices were also consumed more in families of higher income group but roots and tubers were consumed more in low income group. The high intake of roots and tubers by low income group probably could be due to the fact that roots and tubers were the major crops and relatively cheaper, therefore being within their reach.

As compared to the standard value, the mean intake of cereals, meat, egg and sugar consumption was lower whereas pulses, roots and tubers and other vegetables consumption was higher among the adolescent girls.

The intake of protective foods like green leafy vegetables, fruits and milk was considerably poor among all the income groups and lower than the recommended dietary allowances (RDA) given by the Indian Council of Medical Research (ICMR). It might have been due to ignorance of the girls regarding importance of green leafy vegetables in the diet. Poor purchasing power of these people also might have resulted in suboptimum food intake.

As presented in Table 3 adolescent girls belonging to different income groups were further categorized according to the extent to which the recommended dietary allowances (RDA) were fulfilled.

Table 3 shows that the mean intake of daily energy of the girls was 1736 kilo calories, 1816 kilo calories and 1835 kilo calories in low, middle and high income groups, respectively, which was slightly lower than RDA. The mean intake of protein was 56.37g, 61.05 g, 63.80 g and that of vitamin A was 672.7 µg, 771.2 µg, 928.1µg, respectively among the low, middle and high income groups. The mean intake of iron was same (*i.e* 22mg) among all the income groups. It showed that the mean protein and iron intake was significantly less than RDA. The mean intake of fat was 30.64g, 40g and 38.89 g in low, middle and high income groups, respectively and it was significantly higher as compared to RDA.

The results showed that the mean daily intake of energy, protein, iron and vitamin A fell short of RDA in most of the girls. Thus, the dietary survey pointed towards a poor intake of food in terms of quantity and quality. The mean intake of protein, iron and vitamin A was greatly reduced in low and middle income group. However, girls in high income group had only a slight reduction in their nutrient content. The intake of fat, calcium, thiamin, riboflavin and vitamin C was found to be higher than the RDA in all the income groups.

Summary and conclusion :

Dietary and nutrient intakes of 300 adolescent girls was estimated by using the 24-hour dietary recall survey method and adolescent girls were classified according to their socio-economic status (low, middle and high income groups). The present study revealed that the mean intake of rice, wheat and other cereals was significantly lower in families of high income group but roots and tubers were consumed more in low income group. The intake of qualitative food such as milk and milk products, pulses, legumes and fruits increased significantly with increase in monthly income. When compared to the standard value, the mean intake of cereals, meat, egg and sugar consumption was lower whereas that of pulses, roots and tubers and other vegetables was higher than the standard value among all the adolescent girls. Mean daily intake of energy, protein, iron and vitamin A fell short of RDA in most of the girls. The mean intake of protein, iron and vitamin A was greatly reduced in low and middle income group. The intake of fat, calcium, thiamin, riboflavin and vitamin C was found to be higher than the RDA in all the income groups. Thus, intake of certain foods and nutrients varied among adolescent girls of different income groups. This suggests that there is a need for nutrition education among adolescent girls and more stress should be laid on planning and implementing nutrition programmed for adolescents.

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