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Assessment of dietary intake of anaemic adolescent school girls

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Abstract
Iron deficiency anaemia (IDA) is a lack of iron in the body which reduces the ability to produce haemoglobin, a pigment in red blood cells. Adolescence is a crucial phase of growth since it offers the second and last chance to catchup growth in the life cycle of girls. Adolescent girls are particularly pron to iron deficiency anaemia because of the increased demand of iron by the body. In adolescence the protein and calorie requirements are at maximum level. It is important to know the health and nutritional status of this group. The diet survey of the communities not only provide essential information regarding the deficiencies but also the quantity and type of food required for correcting anaemia. Their haemoglobin value was estimated using cyanmet method. For the dietary survey work, adolescent girls were purposive selected. Dietary consumption includes assessment of food consumption, calculation of nutritive value and comparison with nutritional requirements. The study revealed that a decline in calorie, protein and iron intake was evident with increasing severity of anaemia. Reducing iron deficiency anaemia can not only improve nutrition and work output of the adolescent girls but also the overall health status that ensure a better quality of life.

Keywords: adolescent girls, questionnaire method, dietary consumption, iron intake

Introduction
Good nutrition is the key to a healthy and productive life. Inadequate or imbalanced nutrition causes malnutrition, which retards the progress and productivity in all areas of national development. Iron deficiency anaemia is a global public health problem as compelling and harmful as epidemics of infectious diseases. It affects millions of people around the world, most of them are women and young children. Anaemia mainly affects women and young children. Anaemia affects women just before their periods end (pre menopause), teen age girls, pre mature babies and the babies born with a low birth weight. Adolescence is a particularly unique period of life because it is a time of psychological and cognitive development. In the adolescent dramatic and physical changes include redistribution of fat, increase in lean body mass and enlargement of main organs include sexual components. Diet survey is an integral part of any study of nutritional status of individual or group because it yields important information on sources of nutrients, nutrient intake levels and attitudes. The objectives of the study is not only to assess nutritive value from the results of diet survey but also provides a help in the interpretation of the cause and suggest a remedy for anaemia in school going adolescent girls. The diet survey of the communities not only provide essential information regarding the dietary deficiencies but also the quantity and type of food required for correcting these deficiencies. In the present study the nutrient intake, food habbits and cooking practices of the anaemic adolescent girls were studied.

Material and Method: The experimental procedure adopted for the study are as under:

A) Screening of anaemic Girls

a. **Selection of samples:** Samples were taken from different government high school of Raipur city of Chhattisgarh state. A sample of 360 school going adolescent girls were selected on the basis of purposive sampling method. The subjects were divided into two groups i.e. 13-15 years (early adolescence) and 16-18 years (late adolescence).

b. **Estimation of Haemoglobin:** Estimation of haemoglobin was carried out by Cyanmet method.

B) Categorization for anaemia: The subjects were categorized as per WHO (world health organization) standard for anaemia into mild, moderate and severe categories. 120 girls were taken from each category and thus the sample consisted of 360 girls.

C) Assessment of food consumption

1) Diet survey: Dietary consumption of adolescent anaemic school going girls was assessed by using questionnaire method. Measuring cups, spoons and glasses were used to help the girls in estimating the quantity of foods consumed by them. This procedure was repeated for three consecutive days.

a) Calculation of nutritive value: For calculation of nutritive value of diets consumed by the subjects, the cooked foods were converted into raw food stuffs with the help of standard recipes. Nutritive value was calculated using the food composition table (ICMR 1981).

b) Comparison with R.D.A. Values: Obtained data was then compared with the Recommended Dietary Allowances [R.D.A.].

Finding and Discussion

Distribution of 360 anaemic subjects selected for the study as per their age is depicts in Table -1. In the present study the number of anaemic subjects in lower age group was found to be higher than the higher age group. So we can conclude that the prevelence of anaemia in lower age group was greater than the higher age group. Similar result were observed in the study of Gawarikar, R.S. *et al*. In this study higher prevalence of anaemia wasalso found amongst the age group above 14 which might have been due to menstrual blood loss without sufficient iron intake by this group.

Table 1: Distribution of 360 anaemic subjects selected for the study as per their age

Age group (year)	Mild anaemic (10-12g/dl)	Moderate anaemic (7-10g/dl)	Severe anaemic (Below 7 g/dl)	Total No.
13-15	88	63	70	221
16-18	32	57	50	139
Total	120	120	120	360

Calorie intake is the final indicator of food value that one takes. The distribution of mean calorie intake of selected subjects and its percent adequacy was compared with respect to R.D.A. value (Table-2). The overall average calorie intake in 13 to 15 years age group was 1620.38 kcal per day and its adequacy was 78.65% of the R.D.A. (2060 kcal). Similarly in the age group of 16-18 years, overall average calories intake was 1615.82 kcal per day and its adequacy was 78.32% of the RDA (2060 kcal). The average calories intake in both the age groups when compared to RDA for mild group was found to be higher than the moderate and severe groups. The present data shows that the average percent adequacy was approximately similar in both the age groups. The Study reveals that as the degree of severity of anaemia increases among the subjects their calorie intake was PR optionally found to be lower. There are many reasons of low calorie intake amongst the adolescent girls. The food consumed by them is generally deficient in quality as well as quantity. The packed lunch carried by them is not adequately nutritious. They generally give very less importance to morning breakfast.

Table 2: Mean calorie intake (kcal per day) and its percent adequacy

Age Group	Mild Anaemia	Moderate Anaemia	Severe Anaemia	Average value	R.D.A. Value (Kcal)
13-15 years (n=221)					
A. Intake	1629.23	1618.29	1613.44	1620.38	2060
B. Adequacy (%)	79	78.55	78.32	78.65	
16-18 years (n=139)					
A. Intake	1635.07	1619.02	1593.37	1615.82	2060
B. Adequacy (%)	75.37	78.6	77.34	78.32	

The average protein intake of the selected subjects and its adequacy was judged with respect to RDA value (Table-3). The average protein intake was 47.60 g per day and its adequacy was 73.23% of RDA (65 g) for the age group of 13-15 years. In the age group of 16-18 years average protein intake per day was 43.31 g and its adequacy was 68.74% of the RDA (63 g). The average protein intake when compared to RDA for all the three group of severity, it was found lower and when compared with respect to age it was lower in the age group of 16-18 year, then 13-15 age group where it was required.

Table 3: Mean protein intake (g) and its percent adequacy

Age Group	Mild Anaemia	Moderate Anaemia	Severe Anaemia	Average value	R.D.A.Value (g)
13-15 years (n=221)					65
A. Intake	53.68	45.95	43.19	47.60	
B. Adequacy (%)	82.58	70.69	66.45	73.23	
16-18 years (n=139)					63
A. Intake	46.98	43.66	39.29	43.31	
B. Adequacy (%)	74.57	69.30	60.34	68.74	

The average fat intake of the selected subjects and its percent adequacy was judged with respect to R.D.A. (Table-4). Table depicts the overall average was 36.37 g per day with an adequacy of 79.44% of the RDA, which has been calculated to be 45.78 g [13-15 years]. In the age group of 16-18 years the overall average was 37.25g with an adequacy of 81.36%.It is obvious from the results that there is not much difference between the fat intake of both the age group of subjects. Their diet include fat only as cooking oil, ghee, butter and other forms of fat are hardly consumed. Pressure cooking, steaming, shallow frying are the common methods used for cooking food which do not involve large quantity of fat.

Table 4: Mean fat intake (g) and its percent adequacy

Age Group	Mild Anaemia	Moderate Anaemia	Severe Anaemia	Average value	R.D.A. Value (g)
13-15 years (n=221)					45.78*
A. Intake	36.49	36.35	36.28	36.37	
B. Adequacy (%)	79.70	79.40	80.12	79.44	
16-18 years (n=139)					45.78*
A. Intake	37.99	37.68	35.33	37.25	
B. Adequacy (%)	82.98	82.30	77.17	81.36	

*-Calculated value

The average intake of carbohydrate and its percent adequacy was compared with respect to R.D.A.(Table 5).It indicated that in the age group of 13-15 year the average carbohydrate intake was 274.32 g with an adequacy of 79.05% therefore in the age group of 16-18 year the overall average (per day) was 279.85 g with an adequacy of 80.64%. The results reveal that a slight decline in carbohydrate intake was evident with increasing severity of anaemia. In all the three groups the major source of diet is rice which fulfilled the large portion of energy particularly in the form of carbohydrate. Intake of carbohydrate in the form of sugar was low.Parboiled rice and rice flour was also consumed.

Table 5: Mean carbohydrate (g) intake and its percent adequacy

Age Group	Mild Anaemia	Moderate Anaemia	Severe Anaemia	Average value	R.D.A. Value (g)
13-15 years (n=221)					347*
A. Intake	277.18	273.90	271.74	274.32	
B. Adequacy (%)	79.87	78.93	78.31	79.05	
16-18 years (n=139)					347*
A. Intake	283.42	278.43	276.68	279.85	
B. Adequacy (%)	81.67	80.23	79.73	80.64	

*Calculated value

Table 6 depicts the average intake (mg/day) of calcium in selected subjects. The average calcium intake when compared to RDA, was found to be 410.78mg and its adequacy was 68.46% of the RDA (600mg) in the 13-15 years. The average calcium intake when compared to RDA, was found to be lower in all the three groups. Similarly in 16-18 years, the overall average intake (per day) was 384.52 mg and its adequacy was 76.90% of the RDA (600mg). The findings suggest a low intake of calcium with increased severity of anaemia. Beside this average calcium intake was found to be higher in the age group of 13-15 years than the 16-18 years. The diet survey analysis shows that most of the calcium was supplied through leafy vegetables like amaranthus, radish leaves and spinach. The availability of calcium from cereal based diets was lower.

Table 6: Mean calcium intake (mg) and its percent adequacy

Age Group	Mild Anaemia	Moderate Anaemia	Severe Anaemia	Average intake(mg)	R.D.A. Value (mg)
13-15 years (n=221)					600
A. Intake	414.91	409.69	406.13	410.78	
B. Adequacy (%)	69.15	68.28	67.70	68.46	
16-18 years (n=139)					500
A. Intake	386.78	385.07	382.47	384.52	
B. Adequacy (%)	77.35	77.01	76.49	76.90	

The average iron intake in selected subjects and its percent adequacy was judged (Table 7). The overall average was 20mg per day with an adequacy of 66.67% (16-18 year). Findings indicate that iron intake was found to be more in the higher age groups than the lower age groups. The overall average of iron intake was 14.92 mg per day with an adequacy of 53.28% (13-15year). The poor intake of iron could be due to the use of cereals and green leafy vegetables in the diet. The subjects of the present study were not consuming iron rich foods like organ meat, dried beans, peas, dried fruits, nuts, lentils, fortified cereals in their diet. The absorption of iron is less from leafy vegetables and lest from cereals. Iron absorption is better from animal foods than vegetables foods. The reason for deficiency may be poor absorption from cereal based diet even though the total iron in the diet was adequate.

Table 7: Mean iron intake (mg) and its percent adequacy

Age Group	Mild Anaemia	Moderate Anaemia	Severe Anaemia	Average intake(mg)	R.D.A. Value (mg)
13-15 years (n=221)					
A. Intake	15.29	14.89	14.64	14.92	28
B. Adequacy (%)	54.60	53.17	52.28	53.28	
16-18 years (n=139)					
A. Intake	20.31	20.18	19.53	20.00	30
B. Adequacy (%)	67.70	67.26	65.10	66.67	

The average ascorbic acid intake of the selected subjects and its percent adequacy was judged with respect to R.D.A value (Table-8). In the age group of 13 to 15 year the mean intake was found to be just double when compared to RDA in all the

three groups of severity of anaemia. Similarly in the age group of 16 to 18 year the mean intake of ascorbic acid found to be higher. The intake of vitamin 'c' was highest in mild anaemic group, intermediate in moderate anaemic group while it was found to be lowest in the severe anaemic group. Though the calculated values of vitamin 'c' seems to be higher, but the actual values may be some what lower as this vitamin is a heat sensitive vitamin and about 2/3 of it is destroyed during normal cooking procedures. The good intake of green leafy vegetables, salad and seasonal fruits may be the reasons of high intake of vitamin "c".

Table 8: Mean ascorbic acid intake (mg) and its percent adequacy

Age Group	Mild Anaemia	Moderate Anaemia	Severe Anaemia	Average intake(mg)	R.D.A.Value
13-15 years (n=221)					
A. Intake	83.17	80.84	80.15	81.54	40
B. Adequacy (%)	207.92	202.10	200.37	203.85	
16-18 years (n=139)					
A. Intake	74.89	74.70	70.50	73.05	40
B. Adequacy (%)	187.22	186.75	176.25	182.62	

The mean folic acid intake and its adequacy percent was judged with respect to RDA value (Table 9). The intake of folic acid of subjects of lower age group was more than the subjects of higher age group. The intake of folic acid of the anaemic girls was found to be even lower than 50% of the standard intake. This may be due to low intake of legumes and other non vegetarian foods. Folic acid is an essential component for RBC maturation. Hence its deficiency may lead to megaloblastic anaemia.

Table 9: Mean folic acid intake (mg) and its percent adequacy

Age Group	Mild Anaemia	Moderate Anaemia	Severe Anaemia	Total	R.D.A. Value (mg)
13-15 years (n=221)					
A. Intake	51.32	48.58	48.22	49.56	100
B. Adequacy (%)	51.32	48.58	38.81	49.56	
16-18 years (n=139)					
A. Intake	40.09	39.77	38.81	39.68	100
B. Adequacy (%)	40.09	39.77	38.81	39.68	

Results reveal that the nutritional status of the mild anaemic subjects was certainly better than the moderate and severly anaemic subjects but even then the deficiency of all important nutrient was observed in all the groups of subjects. Especially the deficiency of blood forming elements was quiet evident. Cereal based diet rich in phytate, poor intake of animal protein, large intake of milled rice after discarding the extra cooking water and iow class protein, may act at either primary or contributory factor/factors for the wide prevalence of anaemia. Faulty cooking habbits, unhygienic environment also intensify the problem of anaemia. So it is necessary that nutrition education and iron supplementation should be given and also a balance diet plan be prepared which could fit in the financial resources of these girls. Besides this, fortification of various foods with iron may also prove to be effective in combating anaemia among the vulnerable group. Reducing iron deficiency anaemia can, not only improve nutrition and work output of the adolescent girls but also the overall health status ensures a better quality of life.

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References

1. Gawarikar RS, Gawarikar SB, Tripathi BC. Prevelence of anaemia in adolescent girls of Ujjain in western M.P. The Ind. J Nutr. Dietet. 2002; 39:493.
2. Akkamahadevi KH, Kasturba B, Katarki PA. Energy and blood forming nutrients in the diets of urban and rural adolescent girls Ind. J Nutr. Dietet. 1998; 33:196-204.
3. Bains K, Mann SK. Sub clinical iron deficiency – a major factor in reducing physical fitness of young women. The Ind. J Nutr. Diet., 2000;35:101.
4. Kanani SJ. Supplementation with iron and folic acid enhances growth in Indian adolescent girls. J Nutr.2000; 130(2):452s-455s.
5. Thanga Leela T, Shanthi Priya. Iron status and mobidity pattern among selected school children. The Ind. J Nutr. Dietet. 2002; 39, 216.
6. Anuradha V, Sangeetha K. Development and impact of soymalt product in improving the iron status of anaemic adolescent girls (16-18 years). The Ind. J Nutr. Dietet. 2001; 38:141.