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Eating Pattern, Nutritional Status and Anaemia-Related Knowledge in Rural Adolescent Girls of Panipat (Haryana)

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Abstract: **Objectives are to examine eating pattern and nutritional status of adolescent girls of Panipat, (Haryana) with a particular focus on the prevalence of anaemia and appropriate knowledge about it among them.**
Methods: A study was conducted on 300 adolescent girls aged 13-18 years randomly selected from Madulda block of Panipat district. A 7-day food frequency questionnaire was used to investigate the eating pattern. Nutrient intake of the participants was assessed by 24h recall method.
Results: Habitual eating pattern indicated poor consumption of pulses, milk, leafy vegetables and fruits. Food intake data revealed mean intakes of protein, calcium, iron; vitamin C and vitamin A were significantly lower than RDA. Anthropometric data indicated that about 22% of the participants were underweight, 72% were normal and only 6% were overweight .The prevalence of anaemia (Hb<12 g/dl) among the participants was 78%. About 7% had low serum iron (<40 =g/dl), 13% showed evidence of iron-deficient erythropoiesis (Transferrin Saturation <15%), 45 per cent did not had knowledge about the causes of anaemia; while 52% and 60% respectively, knew about the prevention and treatment of anaemia. Surprisingly, 63.8% of the participants were not aware about the sources of iron-rich foods.
Conclusions: Results indicate an overall poor nutritional status of rural adolescent college girls in Panipat and need for appropriate nutrition interventions to overcome the problem.

Keywords: **Adolescent Girls, Eating Pattern, Nutritional Status and Anaemia-Related Knowledge.**

1. INTRODUCTION

Adolescence is an important stage of growth and development in the lifespan. Unique changes that occur in an individual during this period are accompanied by progressive achievement of biological maturity. (20) This period is very crucial since these are the formative years in the life of an individual when major physical, psychological and behavioural changes take place. Adolescent girls, constituting nearly one tenth of Indian population, form a crucial segment of the society.(21) The girls constitute a more vulnerable group due to enhanced growth during adolescence, the requirement of some minerals is of paramount important. A rapid growth rate combined with a marginal nutrient intake increases the risk of nutritional deficiencies in this population. Micronutrients such as iron and zinc are essential trace elements involved in the high growth rates of adolescents. In general rural adolescent girls are the worst sufferers of the ravages of various forms of malnutrition because of their increased nutritional needs and low social power.(5) The nutritional status of adolescent girls, the future mothers, contributes significantly to the nutritional status of the community. Poor nutritional status during adolescence is an important determinant of health outcomes at a later stage of life. Therefore, attention should be given to adolescent health and nutrition. Few studies have been done in the last couple of years to identify the extent and consequence of malnutrition in rural and urban adolescent school girls, (2). Results of these studies particularly confirmed the higher prevalence of anaemia and iron deficiency along with some other micronutrient deficiencies. Despite all these important considerations, adolescent girls did not receive adequate attention in rural areas in our country, as only recently few studies have been carried out in this population group.(18,19)The present study aimed at investigating dietary

pattern, nutrient intake and nutritional status in rural adolescent girls of Panipat, with a particular focus on the prevalence of anaemia and appropriate knowledge about it among them. Findings of this study could be critical to formulate the appropriate intervention programmes to solve nutritional problems among adolescent girls.

2. SUBJECTS AND METHODS

The present study was carried out in Madlauda Block of Panipat district. In Madlauda block, there were 18 Govt. approved senior secondary schools. Randomly three schools were selected in the present study. There were 1642 girls of 13-18 years of age studying in these school. Out of these 300 female students between 13-18 years were selected randomly for the present study. Those with any sign of chronic infection or metabolic disorder were excluded from the study after recording their history of occurrence of diseases and examining the clinical signs of diseases by a physician. The study was approved by the Department, University of Kurukshetra, Kurukshetra and was conducted after obtaining written consent from the parents of the participants.

Information on socio-economic conditions, dietary intake and food habit, knowledge about anaemia was obtained with a pre-tested questionnaire. Questionnaire-cum-interview method was used to study food consumption pattern. Dietary intake of individuals was recorded using 24 h recall methods for three consecutive days (2 working days + 1 holiday). Data was collected using the method of National Nutrition Monitoring Bureau (1980).

To estimate portion size of food consumed, different types of serving plates, glass, cups, and spoons were displayed. From the size and volume of food consumption obtained by this method, weight of each serving of different food items was calculated. The amount of cooked food consumed was converted into raw ingredients and nutrient intake was calculated using food composition tables of ICMR (7). Average daily intake of nutrients was calculated taking mean of each nutrient for three consecutive days (2 working day + 1 holiday).

Information about the habitual dietary pattern of the subjects was obtained using a 7-day food frequency questionnaire on selected food items. All participants were asked about the causes, preventive measures and treatments of anaemia to examine their knowledge about this major public health problem.

Appropriate knowledge of the participants on various iron rich foods was also assessed.

Five milliliters of blood were collected from each participant with a disposable syringe and 20 Ql of whole blood were directly transferred into 5.0 ml Drabkin's reagent for the measurement of hemoglobin. An aliquot of blood was dispensed into a heparinized tube for collection of plasma and remaining portion was used to separate serum.

Anthropometric data and blood samples were collected following the interview. Body weight (bare footed) of the subjects was measured to the nearest 0.1 kg. Height (bare footed) was measured in the standing position to the nearest 0.1 cm. Weight and height were measured on a combined height-weight scale (Detecto-Medic; Detecto Scales Inc., USA). Body mass index (BMI) was calculated as weight (kg) divided by height in meter squared. Height-forage (Ht/Age) and weight-for-age (Wt/Age) were calculated from United States National Center for Health Statistics' (NCHS) reference value. (9)

Haemoglobin and total-iron-binding capacity (TIBC) concentration were measured by using commercial kits.Serum transferrin saturation was calculated by dividing serum iron concentration by TIBC, multiplied by 100.

Data were analyzed using SPSS for Windows version 12 (SPSS Inc, Chicago). Results are expressed as mean±SD (standard deviation), median and range wherever appropriate. Pearson's correlation test was performed to determine the association among various biochemical indices.

A structured questionnaire to evaluate awareness on anemia among adolescent girls was prepared which included 16 questions related to anemia, its common cause, sign and symptoms of anemia, treatment & prevention to examine their knowledge about this major public health problem.

3. RESULTS

Majority of the respondents (65.3%) were in the age group of 13-15 years and 34.6 per cent of subject were of age 16-18 years. About half of the participants' fathers (46%) were university graduates, whereas only 18 per cent of their mothers had a graduation degree. The majority (76%) of the participants came from medium-sized (5-6 members) whereas only 6 percent had small sized family (family members less than 5). Four percent of the participants' family had low annual

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income(less than Rs 53,000) and 68 per cent of the participants had family income above Rs 96000 annually. A substantial proportion (93.3%) of the participants lived in their own house.

All the participants consumed cereals daily. About half of the participants consumed pulses fortnightly. A large proportion of the participants consumed meat (62.5%), fish (53.8%) and eggs (58.4%) 3 to 4 times or less in the week preceding the interview (Table-1). A substantial proportion of the girls consumed milk and milk products daily (95.7%).Most of the participants consumed milk in form of tea or buttermilk. About one- third(35%) consumed green leafy vegetables fortnightly; while substantial proportions of the participants had other vegetables (86%) daily. Fruits were less popular among the girls, being consumed rarely(76%) by participants. Most of the fruits consumed were mango, banana, ber, lemon, orange and guava.

Table -1 Pattern Intake Of Selected Food Items By Rural Adolescent Girls.

FOOD ITEMS	DAILY	2 – 3 TIMES A WEEK	FORTNIGHTLY	RARELY	NEVER
CEREAL	100	0	0	0	0
PULSES	2	11	56.7	28	21.3
MEAT	0	(3.6)	(33.3)	0	0
EGG	0	(10.3)	(4.6)	0	0
MILK AND MILK PRODUCTS	95.7	4.3	0	0	0
LEAFY VEGETABLES	4	30	35	28	3
ROOT AND TUBERS	86	7	7	0	0
OTHER VEGETABLES	86	10	4	0	0
FRUITS	0	0	23	76	0

Results are expressed as the percentage (%) of the participants consuming different frequencies of each food items.

The daily mean intake of energy by majority of adolescent girls was adequate which was 75.58 and 70.97 per cent of RDA by 13 -15 and 16-18 years old adolescent girls respectively. Intake of energy was significantly adequate when compared to RDA. Mean intakes of protein, calcium, iron, vitamin C and vitamin A were significantly lower than RDA (Table-2).

Table 2: Mean Daily Nutrient Intake Of Adolescent Girls As Compared To Recommended Dietary Allowances (RDA)

	13 TO 15 years(n = 196)				16 TO 18 years (n = 104)			
NUTRIENTS	INTAKE	RDA	RDA %	"Z" VALUE	INTAKE	RDA	RDA %	"Z" VALUE
Protein (gm)	34.18 ± 5.42	65	67.96	79.60**	32.98 ± 4.47	63	52.34	68.43**
Energy(kcal)	1556.91 ± 306.47	2060	75.58	22.98**	1462.07 ± 128. 47	2060	70.97	47.42**
Calcium (mg)	350.02 ± 23.55	600	58.34	148.60**	323.09 ± 43.27	500	64.61	41.66**
Iron (mg)	13.20 ± 2.04	28	47.14	101.57**	15.80 + 2.53	30	52.66	57.19**
β - carotene (µg)	1980 .24 ±84.3	2400	82.51	69.71**	1845.78 ± 71.3	2400	76.91	79.20**
Vitamin c (mg)	27.26 ± 3.27	40	68.51	54.54**	22.71 ± 1.9	40	56.8	92.73**

Source :- Nutrient requirement and recommended dietary allowance for Indians a report by the expert group of the Indian council of medical research 1989

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Table-3 shows the biochemical indices for iron status and the nutritional characteristics of the participants. Among the participants the mean BMI ranged from 18.9-20.7kg/m^2 . When considering BMI categories to NHANES values, about 22% of the participants were underweight, 72% were normal and only 6% were overweight. Mean serum values of iron, TIBC, TS and of the adolescents were within the normal range (Table-3).

Table : 3 Anthropometric And Biochemical Indices Of Rural Adolescent Girls

VARIABLE	MEAN (± SD)	RANGE
ANTHROPOMETRY		
BODY WEIGHT(KG)	41.59 ± 3.19	32.0-60.0
HEIGHT (CM)	150.48 ± 3.86	139.6-167.6
BMI (KG/M^2)	18.43 ± 3.54	14.7-27.3
BIOCHEMISTRY		
HAEMOGLOBIN (G/DL)	10.43 ± 1.13	7.3-11.5
IRON (UG/DL)	96.58 ± 33.28	25.5-146.2
TIBC (UG/DL)	393.64 ± 12.28	265.4-570.4
TS (%)	24.56 ± 8.59	4.6-49.5

SD: Standard deviation, BMI: Body mass index, TIBC: total iron binding capacity, TS: Transferrin saturation.

Only 22% of the subjects had normal haemoglobin concentration (Hb>12.0 g/dl); while 78% had anaemia (Hb<12.0 g/dl) as per WHO recommendation. Of the total participants, about 7% of the girls had low serum iron (<40.0 µg/dl). A considerable proportion of the participants (13%) had iron deficient erythropoiesis as per the cut-off value of serum TS (<15%).14 Table-4 shows the significant correlation between various biochemical variables. Haemoglobin (Hb) concentrations were found to be positively correlated (r= 0.73, p<0.001) with serum iron, and TS (r = 0.86 p< 0.001); While serum iron was negatively correlated with serum TIBC (r = -0.64, p<0.001).

Table – 4 Correlations between Hemoglobin and Iron Indices

VARIABLE	HB (G/DL)	IRON (UG / DL)	TIBC (UG/DL)	TS %
hb (g/dl)	r= 1.0	r = 0.73	r = -0.89	r = 0.86
iron (ug/dl)		r = 1	r = -0.64	r = 0.93
tibc(ug/dl)			r = 1.0	r = -0.81

Seventy three percent of the participants had good idea about anaemia. These participants said that when a person has iron deficiency it hampers the formation of haemoglobin and causes deficiency of haemoglobin in the blood which is known as anaemia. Among them about 45% of the participants said that they do not know about the causes of anaemia; while the remaining 55% replied in the affirmative. The participants who knew about the causes of anaemia gave multiple answers. All participants responded with iron deficiency and majority with inadequate intake of specific food items as the causes of anemia. Among the food items, majority of the participants mentioned about the inadequate intake of egg (56.1%), meat (37.6%), vegetables (92.8%), and fruits (46.2%).

About 52% participants said that anaemia can be prevented and 41.5% had no idea about prevention; while 6.2% said that anaemia cannot be prevented. Among the participants who said that anaemia can be prevented, many gave multiple answers. Nearly 98.0% of the participants believed that taking iron tablet and iron containing foods; while 82.2% and 74.4%, respectively, said that taking vitamins and medicine were preventive measures. Among those who mentioned taking iron containing foods as preventive measures of anaemia, a large number talked about the intake of green leafy vegetables (93.6%), fruits (75.1%), meat (24.6%) and egg (64.4%).When the participants were asked about the treatment of anaemia, nearly 60% said that it can be treated; while the remaining 40% had no idea. Among the participants who said that anaemia can be treated, many gave multiple answers. Most of the participants mentioned about taking iron tablet (88.4%), vitamins (73.1%), medicine (67.3%) and iron containing foods (88.4%) as a measure of treating anaemia. Among those who believed that taking iron containing foods was a treatment of anaemia, a large number mentioned about the intake of green leafy vegetables (84.6%), fruits (70.7%), egg (47.3%), and meat (42.3%).

4. DISCUSSION

Data collectively indicate that majority of the participants belonged to the families of low to moderate socio-economic status. The consumption frequencies of protein rich foods such as meat, fish and eggs, in most of the participants were low, although a large proportion (95.7%) consumed milk and milk products. It was also observed that considerable proportions of the participants consumed leafy vegetables but the intake of leafy vegetables was seasonal and in poor amount as compared on the basis of the requirement of nutrients from them. A higher percentage of the participants (76%) ate fruits rarely, similar findings was reported previously on adolescent school girls. (5) Fruits consumed are good sources of energy, iron and vitamin C. The low intake of fruits may be due to due to preference to chips, samosas rather than fruits. Low intake of fruits has also been reported (31).

Food consumption data revealed that the daily energy intake by the adolescent girls was not sufficient; fulfilled only about 70% of RDA, much lower than the energy intake of their counterparts in rural areas. (16)Protein intake of the participants was about 30 g/day which was nearly half of RDA, indicating inadequate intake of protein. Meat and eggs, which are rich sources of protein, are not preferred food items as most of the adolescents' girls were vegetarian. Accordingly, low intake of protein by adolescent girls of the present study was expected and quite rationale.(29,30,32)

Ahmed et al.(5) previously reported that urban adolescent school girls of India consumed iron only 10 mg/day. Adolescent girls of the present study consumed iron 13-15 mg/day, which was insufficient in terms of RDA. This revealed that improvement should be made in iron intake of adolescent girls. The improvement in iron intake might be attributed by imparting the knowledge and awareness of their parents about the major iron rich foods and requirement of iron at that age and participant's preferential treatment by parents. The intake of vitamin A and C by participants were also below the RDA. Fish, milk, green leafy vegetables and fruits are the rich sources of vitamin A (pro and preformed vitamin A). Less frequent intakes of these food items in the diet contributed to the lower intake of vitamin A. Due to lack of availability, consumption of fruits is lower in rural areas.This may also be the reason of lower dietary intake of vitamin C than its RDA (Ahmed et al. 2000)).

On average, about 22% of the girls were also found underweight ($<5^{th}$ centile of the NHANES reference value). Also using a cut-off point of <18.5 kg/m2 for BMI, about 48% of the girls were found underweight. These results provide substantial evidence of an overall worse nutritional status in the rural adolescent girls of Panipat. In the present study, 78% of the girls were anaemic (Hb<12 g dl), which was similar to an estimate of 70% in an earlier study on adolescent school girls (33). This may be due to the lack of appropriate knowledge on anaemia and iron rich foods as well as inadequate intake of foods, rich in iron. The data of the present study is similar to the data of developed countries, our findings correspond with studies from SAARC countries.(23-27) The studies highlight a high prevalence of anaemia with multiple micronutrient deficiencies in adolescent girls. The high prevalence of anaemia and iron deficiency in the subcontinent can be related to a similar kind of diet consumed in these areas.

Among the participants about 7% had low serum iron (<40 Qg/dl); and 13% had iron deficient erythropoiesis (serum TS<15%). The reason of iron deficiency in some participants may be due to relative unavailability of iron in the diet or due to endogenous control of the rate of uptake. The study has a limitation in identifying iron deficiency, as we did not estimate serum ferritin, which is considered as the most sensitive indicator of iron status. It may also be mentioned that now serum transferrin receptor is considered to be the more reliable indicator for the assessment of iron deficiency.(28) Thus, the present study merits further investigation. Most of the participants in the present study had TIBC value within the normal range. Increased TIBC level was found only in the participants with iron deficiency, indicating that they had low iron stores in the body and fewer of the iron spots on the transferring molecules were filled by iron, thereby increasing TIBC.

We found an association between Hb levels and various iron indice. A significant positive association between haemoglobin and serum iron levels reveals that good iron status compromises iron metabolism and hence haemoglobin formation. Positive correlation of haemoglobin with TS and negative correlation serum iron with TIBC. Further indicating the availability and essentiality of iron in haemoglobin formation. The positive correlations between iron and TS and negative correlation with TIBC suggest that saturation of transferrin increases with increased iron availability, which consequently decreases TIBC.

Majority of the participants (73%) had good idea about anaemia. About 45% of the participants were not aware about the causes of anaemia. The perception regarding the prevention and treatment of anaemia was low among them. Also, a large proportion of the participants (63.8%) had no idea about the sources of iron rich foods.

5. CONCLUSION

The overall nutritional status in urban adolescent girls of Panipat is not satisfactory. Prevalence of anaemia and knowledge regarding anaemia as well as iron rich foods is not adequate among girls in this study.Thus, effective measures should be undertaken to improve their nutritional status and reduce the prevalence of anaemia.

REFERENCES

[1] Urbano MRD, Vitalle MSS, Juliano Y, Amancio OMS. Iron, copper and zinc in adolescent during pubertal growth spurt. J Pediatr 2002; 78: 327-34.

[2] Ahmed F, Khan MR, Islam M, Kabir I, Fuchs GJ. Anaemia and iron deficiency among adolescent schoolgirls in peri-urban Bangladesh. Eur J Clin Nutr 2000; 54: 678-83.

[3] Ahmed F, Khan MR, Banu CP, Qazi MR, Akhtaruzzaman M. The coexistence of other micronutrient deficiencies in anaemic adolescent schoolgirls in rural Bangladesh. Eur J Clin Nutr 2008; 62: 365-72.

[4] Ahmed F, Hasan N, Kabir Y. Vitamin A deficiency among adolescent female garment factory workers in Bangladesh. Eur J Clin Nutr 1997; 51: 698-702.

[5] Ahmed F, Zareen M, Khan MR, Banu CP, Haq MN, Jackson AA. Dietary pattern, nutrient intake and growth of adolescent school girls in urban Bangladesh. Public Health Nutr 1998; 1: 83-92.

[6] Ali SMK, Pramanik MMA. Conversion factors and Dietary Calculations. Dhaka, Bangladesh: Institute of Nutrition and Food Science, University of Dhaka, 1991.

[7] Gopalan C, Rama-Shastri BV, Balasubramanium SC. Nutritive value of Indian Foods. Hyederabad, India: National Institute of Nutrition, Indian Council of Medical Research, 2000.

[8] INFS. Desiya Khadya Drabber Pustiman. (Nutritive Value of Indegenous Food Stuffs). Dhaka, Bangladesh: Institute of Nutrition and Food Science, University of Dhaka, 1992.

[9] NCHS. Growth curves for children 0-18y. Washington, DC: National Centre for Health Statistics, 1976.

[10] Lowry OH, Lopez JA, Bessey OA. The determination of ascorbic acid in small amounts of blood serum. J Biol Chem 1945; 160: 609-15.

[11] FAO/WHO/UNU. Energy and Protein requirements. WHO Technical Report Series No. 724. Geneva: World Health Organization, 1985.

[12] IVACG. Conversion factors for vitamin A and carotenoids. Washington DC, USA: ILSI Research Foundation, 2002.

[13] WHO: Physical status: the use and interpretation of anthropometry. WHO Technical Report Series no. 854. Geneva: WHO, 1995.

[14] INACG. Measurements of iron status: a report of the International Nutritional Anaemia Consultative Group. USA: INACG, 1985.

[15] Jelliffe DB, Jelliffe EFP. Community nutritional assessment. Oxford, United Kingdom: Oxford University Press, 1989.

[16] Jahan K, Hossain M. Nature and extent of malnutrition in Bangladesh. Bangladesh National Nutrition Survey, 1995-96. Dhaka, Bangladesh: Institute of Nutrition and Food Science, University of Dhaka, 1998.

[17] Bangladesh Bureau of Statistics (Series), Report of the Household Income and Expenditure Survey, various years.

[18] Choudhary S, Mishra CP, Shukla KP. Correlates of nutritional status of adolescent girls in the rural area of Varanasi. The Internet J of Nutr and Wellness, 2009;7(2).

[19] Venkaiah K, Damayanti K, Nayak MU, Vijayaraghavan K. Diet and nutritional status of rural adolescents in India. European J of Clinical Nutr, 2002; 56: 1119–1125

[20] Tanner JM. Growth at adolescence (2nd ed.) Oxford: Blackwell Scientific Publications, 1992

[21] Government of India. Report of the working group on adolescents for the Tenth Five-Year Plan. Planning Commission, 2001; 1-3.

[22] Chowdhury VF, Banu CP, Karim R, Ahmed F. Seasonal Variations in selected biochemical indices of nutritional status in adolescent girls. Bang J Nutr 1997; 10: 5-12. Vol. 60, No. 8, August 2010 637

[23] WHO: Adolescent nutrition: a review of the situation in selected South-East Asian countries. New Delhi: Regional Office of South-East Asia, World Health Organization, 2003; 3-29.

[24] Baig-Ansari N, Badruddin SH, Karmaliani R, Harris H, Jehan I, Pasha O, et al. Anemia prevalence and risk factors in pregnant women in an urban area of Pakistan. Food Nutr Bull 2008; 29: 132-9.

[25] Shah BK, Gupta P. Anemia in adolescent girls: a preliminary report from semiurban Nepal. Indian Pediatr 2002; 39: 1126-30.

[26] Chaudhary SM, Dhage VR. A study of anemia among adolescent females in the urban area of Nagpur. Indian J Community Med 2008; 33: 243-5.

[27] Hettiarachchi M, Liyanage C, Wickremasinghe R, Hilmers DC, Abrahams SA. Prevalence and severity of micronutrient deficiency: a cross-sectional study among adolescents in Sri Lanka. Asia Pac J Clin Nutr 2006; 15: 56-63.

[28] Ferguson BJ, Skikne BS, Simpson KM, Baynes RD, Cook JD. Serum transferrin receptor distinguishes the anaemia of chronic disease from iron deficiency anaemia. J Lab Clin Med 1992: 119: 385-90.

[29] Beckman, B.R. and Wharton, M.A. (1979) Nutrient intake of adolescents. J. Am. Dietet Assoc. 61 : 38.

[30] Bhatia Priyam. (1996) . Nutritional status of adolescent girls in irrigated and unirrigated areas of Hisar district. M.Sc. Thesis, Haryana Agricultural University, Hisar.

[31] Strain, J.J. , Robsen , P.J. Livingstone, M.B.E., Primrose, E.D., Savage, J.M., Cran, G.W. and Boreham, C.A.G. (1994) Estimates of food and macronutrient intake in a random sample of northern Ireland adolescents. Br. J. Nutr.72: 343-352.

[32] Shusheela, 1992. Nutritional status of adolescent girls of Haryana. M.Sc. Thesis, Haryana Agricultural University, Hisar, India.

[33] Sheshadari S .Nutritional anemia in South Asia in Malnutrition in South Asia: A regional profile Ed: Gillespie S. Kathmandu, UNICEF Regional Office for South Asia 1997.