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## Assessment of nutritional status of rural and urban adolescent girls in Udaipur district

**Ruchi Sen and Dr. Sarla Lakhawat**

### Abstract

Adolescent girls are particularly vulnerable to malnutrition because they are growing faster than at any time after their first year of life. Nutrition as most important aspect of life, It not only helps individual to live a sound and healthy life but also guide to cater different nutritional problems. So it is important to assess the nutritional status of adolescent girls to make them aware and implement different nutritional programs. In this context study was conducted with the objective to assess the nutritional status of rural and urban adolescent girls (16-17 years). The study was conducted in four schools. Two schools from Udaipur city and two schools from 'Thoor' and 'Madar' village which comes under the Badgaon Panchayat Samiti were selected. Sixty-sixty adolescent girls were selected for nutritional assessment from schools. Nutritional status was assessed by the help of self-structured questionnaire. Dietary intake of the respondents was collected using 24 hour recall method. Anthropometric measurements like height and weight provide important clues about health and nutritional well- being. The mean height of rural respondent's was  $154.68 \pm 5.29$  cm at survey and urban respondent was  $159.53 \pm 6.53$  cm at survey. The mean weight of rural respondents was  $44.16 \pm 6.25$  kg and the mean weight of urban respondent was  $49.36 \pm 8.32$  kg. 13.33 percent rural respondents and 10 percent urban respondents were lying in category of underweight. In the present study 40 percent of rural respondents and 66.66 percent of urban respondent had normal weight. Further 't' values were calculated between the rural and urban nutrient intake and RDA which revealed that consumption of nutrients comparatively lower than RDA in both rural and urban adolescent girls.

**Keywords:** Anthropometric measurement, nutrient intake, food intake

### 1. Introduction

The term adolescence means, "to emerge" or "achiever identity". Adolescence is a developmental transition between childhood and adulthood. The word adolescence comes from the Latin word *adolescere* which means "to grow" or "grow to maturity". Adolescence is a crucial period when major physical, psychological, and behavioural changes take place Mala *et al.* (2007) [4]. Adolescent girls are a very important section of our society as they are our potential mothers and future homemakers. Unfortunately adolescent girls are a neglected sector of the population of our country. They are poorly fed members of family under our present economic conditions. As a social custom and cultural practice, an adolescent girl enters married life and motherhood when she neither is matured enough to understand the meaning of motherhood nor is in good health to cope with the triple needs of growth, pregnancy and lactation. During adolescent phase, physical changes affect the body's nutritional needs, while changes in one's lifestyle may affect eating habits and food choices. In the age group 15–19 year, 47 percent girls and 58 percent boys were thin, 56 percent girls and 30 percent boys were anemic, 2.4 percent girls and 31.7 percent boys were overweight and 2/1000 adolescent girls and 1/1000 adolescent boys suffer from diabetes. They are also highly prone for eating disorders like anorexia nervosa or binge eating due to body dissatisfaction and depression (NFHS-3, 2007).

Adolescent nutrition is therefore important for supporting the physical growth of the body and for preventing future health problems. Further, emphasis on improvement of nutritional status of adolescent girls through counselling and health education is needed. Adolescent girls are particularly vulnerable to malnutrition because they are growing faster than at any time after their first year of life. They need protein, iron and other micro nutrients to support the

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Adolescent growth spurt and meet the body's increased demand for iron during menstruation. Nutritional status is important determinant of their physical growth and development, which in turn determines the reproductive outcome. The present study was an attempt to improve the condition of rural and urban adolescent girls. The specific objectives of the study were to assess nutritional status of Rural and Urban adolescent girls.

## 2. Methodology

One twenty rural and urban adolescent girls (i.e. sixty-sixty from both the urban and rural schools) ranging between 16-17 years were selected for the present study. The study was conducted in four schools. Two schools from Udaipur city and two schools from 'Thoor' and 'Madar' village which comes under the Badgaon Panchayat Samiti were selected.

As per the objective, the data were collected using anthropometric measurement techniques for height and weight and for calculating the body mass index which was expressed as ratio of weight (kg) to height in meter square. Further, the individuals were classified into different classes based on WHO, (2000).

Food intake was also calculated using 24 hour recall method. Percent adequacy of food intake was assessed by RDI for 16-17 year adolescent girls recommended by NIN-2010 used for analyzing the percent adequacy of food intake.

Nutrient intake was calculated using food composition tables (Gopalan *et al.* 1989)<sup>[2]</sup>. Mean nutrient intake for one day was compared with recommended dietary allowances (ICMR-2010)<sup>[3]</sup>.

## 3. Results and Discussion

**Table 1:** Comparison between mean daily nutrient intake of rural and urban adolescent girls (N=120)

Nutrients	Mean $\pm$ SD			Rural/Urban
	RDA	Rural (n= 60)	Urban (n= 60)	
Energy (Kcal/d)	2440	866.93 $\pm$ 104.46	1164.06 $\pm$ 177.65	-12.13 <sup>NS</sup>
Protein (g/d)	55.5	27.33 $\pm$ 3.31	39.28 $\pm$ 5.49	16.93*
Fat (g/d)	35	20.98 $\pm$ 3.34	25.47 $\pm$ 5.37	5.71*
$\beta$ - carotene ( $\mu$ g/d)	4800	1018.54 $\pm$ 1.54	850.56 $\pm$ 1.00	3.75*
Folic acid( $\mu$ g/d)	200	1.06 $\pm$ 0.48	2.13 $\pm$ 0.84	8.16 <sup>NS</sup>
Carbohydrate (g/d)	366	140.38 $\pm$ 19.95	194.54 $\pm$ 33.76	11.50*
Ascorbic acid (mg/d)	40	38.10 $\pm$ 33.34	42.29 $\pm$ 38.80	1.75 <sup>NS</sup>
Iron (mg/d)	26	9.392 $\pm$ 2.5	12.69 $\pm$ 2.80	6.34 <sup>NS</sup>
Calcium (mg/d)	800	351.74 $\pm$ 68.08	435.11 $\pm$ 81.33	6.34*

Values are in Mean  $\pm$  SD RDA- Recommended Dietary Allowances (ICMR 2010)<sup>[3]</sup>.

\* Significant at 0.5% level NS-Non-Significant

Table 1 throws light on the comparison between mean daily nutrient intake of the adolescent girls from rural and urban schools as observed from the figures in the table that the mean intake of energy of the school girls from rural and urban schools was found to be 866.93 $\pm$ 104.46 kcal/d and 1164.06 $\pm$ 177.65 kcal/d, which was 36.34 percent and 47.70 percent of RDA. Mean intake of protein of the adolescent girls of rural and urban schools was found to be 27.33 $\pm$ 3.31 g/d and 39.28 $\pm$ 5.49 g/d which represents 49.24 percent and 75.69 percent of RDA. Significant difference was observed in the mean intake of protein in rural and adolescent girls and the RDA at ( $p < 0.05$ ). Mean intake of fat for the rural and adolescent girls was observed to be 20.98 $\pm$ 3.34 g/d and were 25.47 $\pm$ 5.37g/d which was 59.94 percent and 72.77 percent of RDA. The intake was significantly lower ( $p < 0.05$ ) than the RDA. Average dietary intake of carbohydrate by rural adolescent girls was 140.38 $\pm$ 19.95 g/d as per the data showcased in Table 1 in rural schools. It was 38.25 percent of RDA which indicates that intake was significantly ( $p < 0.05$ ) less than RDA by the subjects. In urban adolescent girls the average dietary intake of carbohydrates by urban school girls was 194.54 $\pm$ 33.76 g/d and it was 66.79 percent of RDA which indicates that there was significant difference in the intake of the respondents among both schools. The mean intake of calcium among rural and urban adolescent girls of both schools was found to be 351.74 $\pm$ 68.08 mg/d and 435.11 $\pm$ 81.33 mg/d. It was 43.96 percent and 54.38 percent of RDA respectively. The mean intake of iron among rural and urban adolescent girls was 9.39 $\pm$ 2.5 mg/d and 12.69 $\pm$ 2.80

mg/d as per the data presented in Table 1. The results showed that no significant difference was found in intake of iron between rural and urban girls. The mean intake of  $\beta$ -carotene among rural and urban adolescent girls was found to be 1018.54 $\pm$ 1.54 and 850.56 $\pm$ 1.00  $\mu$ g/d which was 21.21 and 29.78 percent of RDA. Mean intake of ascorbic acid for rural and urban adolescent girls was 38.10 $\pm$ 33.34 mg/d and 42.29 $\pm$ 38.80 mg/d which was 95.25 and 127.05 percent of RDA. Mean intake of dietary folate for rural and urban adolescent girls was 1.06 $\pm$ 0.48  $\mu$ g/d and 2.13 $\pm$ 0.84  $\mu$ g/d which was 0.53 percent and 1.06 percent of RDA.

Pouraram and Abtahi (2006)<sup>[6]</sup> compared the dietary pattern and food habits of 168 each urban and rural adolescent girls (14-18 years) in Gilan /Iran. Data were collected by 24 hour recall method for 3 consequent days. The percentage of energy from carbohydrate, fat and protein were 64.3, 24.6, 11.1 in urban and 65.8, 23.2, 11.0 in rural respectively with no significant difference. Calcium, phosphorus, vitamin A and vitamin B2 intake showed lowered among urban and rural adolescent in comparison with RDA.

The dietary survey conducted by '24 hour recall method' for 1 day. Dietary intake of respondents in comparison to the Recommended Dietary Intake (RDI) was substantially low. The diet of rural and urban adolescent girls included fruits (11%, 17%), roots and tubers (22.5%, 27%), milk and milk products (66.66%, 74.33%), green leafy vegetables (55%, 59%) and pulses (21.33%, 24%) and cereals (57.87%, 57.27%), fats and oil (48%, 52%) other vegetables (25.5%, 31%) and sugar (33.33%, 50%).

**Table 2:** Mean± SD and t – value of height and weight of the respondents (N=120)

S. No.	Anthropometry indices	Rural	Urban	Rural/Urban
		Mean± SD	Mean± SD	t value
1.	Height (cm)	154.68±5.29	159.53±6.53	9.64*
2.	Weight(kg)	44.16±6.25	49.36±8.32	4.15*

\*Significant at 0.5 per cent

NS-Non Significant

**(a) Height:** Table 2 indicates that the mean height of rural respondent's was 154.68±5.293 cm at survey and urban respondent was 159.53±6.53cm at survey.

respondents was 44.16±6.25 kg and the mean weight of urban respondent was 49.36±8.32 kg.

**(b) Weight:** As depicted in table 2 the mean weight of rural

**(c) Body Mass Index (BMI)**

**Table 3:** BMI classification of the respondents (N=120)

BMI	Type of malnutrition	Rural		Urban	
		F	%	F	%
<18.50	Underweight	8	13.33	6	10
<16.00	Severe thinness	-	-	-	-
16.00 - 16.99	Moderate thinness	13	21.66	-	-
17.00 - 18.49	Mild thinness	15	25	14	23.33
18.50 - 24.99	Normal range	24	40	40	66.66
≥25.00	Overweight	-	-	-	-
25.00 - 29.99	Pre-obese	-	-	-	-
≥30.00	Obese	-	-	-	-
30.00 - 34.99	Obese class I	-	-	-	-
35.00 - 39.99	Obese class II	-	-	-	-
≥40.00	Obese class III	-	-	-	-

Classification based on WHO, 2000

BMI provides a good correlation to fitness and low correlation with stature.

Data in Table 3 reveals that 13.33 percent rural respondents and 10 percent urban respondent were lying in category of underweight. Malnutrition is a persistent problem in India, though it is often confused with hunger. According to the Food and Agriculture Organization (FAO), about 18 percent of India's population was undernourished in 2012. According to UNICEF, India houses one-third of the stunted, wasted and malnourished children of the world (Virmani, 2013) [7]. In the present study 40 percent of rural respondents and 66.66 percent of urban respondent had normal weight.

#### 4. Conclusion

Many children in low and middle income group in different areas of India, entering adolescence stunted and thin. Adolescence is an opportunity for catch-up growth, but poor diets and the physical demands of early marriage and pregnancy antagonize opportunities for growth. Nutritional status is important determinant of their physical growth and development, which in turn determines the reproductive outcome. Health education and nutritional supplementation is important in this regard. Action is required to improve the same. Adolescent constitutes about 22 percent of the Indian population (Mathur, 2008) [5]. The results of the present investigation reveal that the nutritional status of the respondents was very low due to lack of awareness about nutrition and bad eating habits. There was an imbalance in the diet with more emphases on certain food stuff and negligence of other food stuffs mainly green leafy vegetables, other vegetables, roots and tubers and fruits which was certainly the cause of malnutrition in them.

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