

Assessment of Biochemical and Nutrient intake among adolescent girls (15 -19yrs)

Vijayasree Bandikolla

Department of Human Development and Family Studies, Faculty of Home Science,
Sri Padmavathi Mahila Visvavidyalayam (Women's University), Tirupathi,
Andhra Pradesh, India.

ABSTRACT

The present study has been conducted to assess the Hemoglobin levels and Dietary intakes among girls. The data for the present study have been collected from 100 Adolescents (Girls) were selected in the age group of 15-19 years. Out of 950 members 100 samples were selected by using random sampling method. Blood Hemoglobin levels were estimated using Shahlis hemometer. Using 24 hrs recall method dietary intakes were collected. The study showed that there were lower consumption in several macro and micro nutrients intake compared to Recommended Dietary Allowances (RDA) of India, which may be reflected on their nutritional status and hemoglobin levels also below the WHO standards.

Keywords: Adolescent girls, Hemoglobin levels, Dietary intakes.

INTRODUCTION

The beginning of biological growth and development during adolescence is signified by the onset of puberty, which is often defined as the physical transformation of a child into an adult. A myriad of biological changes occur during puberty including sexual maturation, increases in height and weight, completion of skeletal growth accompanied by a marked increase in skeletal mass, and changes in body composition. Prevalence of iron deficiency, vitamin-B12 deficiency and folate deficiency in our study is comparable to earlier reports from India (Patra *et al.*, 2011, Ahmed *et al.*, 2000 and Khatib *et al.*, 2006).

Young people form precious human resources in every country. However, there is considerable ambiguity in the definition of young people and terms like young, adolescents, adults, young adults are often used interchangeably. World Health Organization (WHO) defines 'adolescence' as age spanning 10 to 19 yr, "youth" as those in 15-24 yr age group and these two overlapping age groups as "young people" covering the age group of 10-24 years (WHO, 2013). Adolescence is further divided into early adolescence (11-14y), middle adolescence (15-17 yr), and late adolescence

18-21 yr (Stang and story, 2012). The present study focused on the Hemoglobin levels and Dietary intakes of Adolescent girls.

MATERIALS AND METHODS

The present study was conducted in a college at Guntur District, Andhra Pradesh, India. The data for the present study have been collected from 100 Adolescents (Girls) were selected in the age group of 15-19 years. Out of 950 members 100 samples were selected by using random sampling method.

Data Collection

The respondents were required to recall their exact food intake during the previous 24-hour period or preceding day. The names and estimated quantities (using standardized measuring cups) were recorded on the questionnaire by the interviewer. The actual nutrient intake was calculated using the nutrient calculator. The average dietary intake of food per item was calculated and was compared with the RDA (Recommended Dietary Allowances) of India using the values as per 'Nutritive Value of Indian Food' (Gopalan *et al.*, 2002).

Biochemical Analysis

Blood Hb levels were estimated using Shahlis hemoglobin as it was convenient to take the blood samples and percentage of Hb levels were compared with WHO standards. (WHO, 1982).

RESULTS AND DISCUSSION

Table 1 shows Mean Hemoglobin levels of adolescent girl. The Mean Hemoglobin levels were 8.2 ± 1.4 mg/dl with the ranges 6.9-11.2 mg/dl. The levels of hemoglobin were below the standards and the levels were compared with the WHO Standards. Hemoglobin (Hb), the iron-containing respiratory protein in red blood cells, is responsible for transporting oxygen from the lungs to the rest of the body. Measured in grams per deciliter (g/dL), hemoglobin levels indicate the blood's ability to carry oxygen and iron. Too little iron interferes with vital functions and leads to morbidity and mortality. Iron deficiency anemia, a more severe stage of iron deficiency (defined as a low hemoglobin in combination with iron deficiency), was found in 3.3 million females (Looker *et al.*, 1997).

Table 2 presented that the nutrient intakes of adolescents (girls) the mean energy intake of Adolescent girls. Mean intakes of energy, protein, total fat, calcium, ascorbic acid and Vitamin B₁₂ were observed to be inadequate and Iron is also lower than the standards. All the nutrients were below the ICMR standards. The present study is in accordance with the studies,

Adolescents are vulnerable to iron deficiency because of increased iron requirements related to rapid growth. Iron needs are highest in females during peak pubertal development because of a greater increase in blood volume, muscle mass and myoglobin (CDCPR, 1998 and Cook, 1999). The beneficiary receives supplemental iron and folic acid. Deficiency of B12 is currently not being addressed through these programs (Kapil and Bhadoria, 2014). Further programmatic research should be organized to gain an understanding of the iron growth relationships in adolescence and the mechanism by which iron improves growth (Kanani and Poojara, 2000) low intake of iron folate and vitamin B12 is a significant determinant towards causing nutritional anemia in adolescents.

CONCLUSION

The present study indicated the Hemoglobin levels and Dietary intakes of adolescent girls, the mean values were below the WHO and ICMR standards. Adolescents are vulnerable to iron deficiency because of increased iron requirements related to rapid growth. Iron needs are highest in females during peak pubertal development and iron is also essential for main physiological functions. So implementation of Iron nutritional programmes and nutrition education regarding iron and Folic acid role in adolescent period is very essential.

Table 1: Mean Hemoglobin levels of adolescent girls

S.no	Adolescents	Hemoglobin levels(mg/dl)	WHO Standards
1	Girls	8.2 ± 1.4 (6.9-11.2)	>12.0

Table 2: Nutrient intakes of adolescents (girls)

S.no	Nutrient	Mean values	Standards
1.	Energy(K.cal)	1335 ± 82.1	2060
2.	Protein (g)	56.5 ± 9.4	63
3.	Fat(g)	22.2 ± 5.8	69
4.	Calcium (mg)	563.7 ± 44.6	500
5.	Folic acid (μ g)	77.5 ± 8.5	100
6.	Iron (mg)	9.4 ± 2.3	30
7.	Vitamin C(mg)	27.5 ± 4.9	40
8.	Vitamin B ₁₂ (mg)	0.9 ± 5.2	1.0

*ICMR (1989) **Based on 30% of energy from fats.

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