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A study on nutritional status of adolescent girls residing in professional college hostel

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Abstract

Adolescence is an intense anabolic phase where the nutrient intake increases. Nutritional deficiencies have far-reaching consequences, especially in pubescent girls. A study was undertaken to measure nutritional level of adolescent girls. The girl students (150 respondents) who were boarders of a Girl's Hostel in Guntur town of Andhra Pradesh were chosen for the study and their nutritional status was assessed. The data collected using a questionnaire was compiled and analyzed for estimation of the dietary condition of adolescent girls. In this study, purposive sampling, mean, percentiles, frequencies and one-sample t-test were used as a statistical tools for analyzing data. The data showed that 37 per cent were undernourished with a BMI range of <math><18.5\text{ kgs/mt}^2</math> and 42.6 percentage of the respondents were observed as moderately anemic. The regular diet of teenage girls was found to provide 1045 kcals, 43 g of protein, 28 g of fat, 169 g of carbohydrates, 6.55 g of iron and 64.22 mg of Vitamin C. One sample t-test revealed that iron consumption from the regular diets of adolescent girls is significantly low ($P>0.01$) compared to RDA of 30 mg. Iron, folate and vitamin C are important nutrients to be provided in adequate amounts in the course of adolescence. So, there is a necessity to enrich the foods of juvenile girls for better nutritional status to meet the nutrient requirement.

Keywords: adolescent girls, nutritional status

Introduction

Adolescence is a vulnerable phase in human development. The demand for nutritional needs increases during exponential growth. This period is described by developmental changes in height, weight and hormones (Gupta 1990)^[3]. Majority of girls begin to grow between the age 13 and 19. Adolescence, could be the nutritional straining stages of life. During puberty, the nutritional needs for the body demand high for physical growth and development also reproductive health (Gopalan *et al.*, 2001). Diet in inadequate nutrients results in undernourishment in pubescent girls in India (Manford and Picciano 2000). Poor dietary habits combined with increased physical activity and the arrival of menstruation impact the possible risk for adolescent's nourishment (Bhaskaran 2001). In India, sexual health of teen-age girls impoverished and they suffer from Nutritional inadequacy. Nutritional status can be distinguished by using various methods like anthropometry, biochemical, clinical assessment and 24 hours dietary recall method. The dietary condition of adolescent girls can be monitored and evaluated by using their measures of height, weight and nutrient intake. The main purpose of the analysis is to assess the nutritional status of young girls at the College of Community Science, ANGRAU, Lam, Guntur.

Results and Discussion

Assessment of nutritional status of adolescent girls

Estimation of nutritional status of teenagers was performed by Anthropometry, biochemical assessment, clinical assessment and 24 hour dietary recall method. In this study, purposive sampling, mean, percentiles, frequencies and one-sample t-test were used as a statistical tool for analysis of data.

Nutritional assessment by anthropometry

The data shown in Figure 1. indicates the classification of teenage girls according to their age group. Most of them (84.7%) were of 17 to 20 years, while 7.3 per cent of participants were 16 to 17 and 8 percentage were 20 to 21 years of age.

Parimalavalli and Sangeetha (2011)^[5] reported that the anthropometric measurements of them were lower for selected girl respondents when compared with National Centre for Health Statistics as a reference population.

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Selected respondents and Indian adolescent girls have shown a significant difference regarding weight, excluding girls between the age group of 15 and 16 years from matriculation school. The mean nutrient intake of the chosen government schoolgirls was significantly lower when compared with RDA

of Indians. Nutrient deficiency could be the main cause for the incidence of under nutrition that can lead to an extreme frequency of infections among adolescents. Similar results were obtained in the present study.

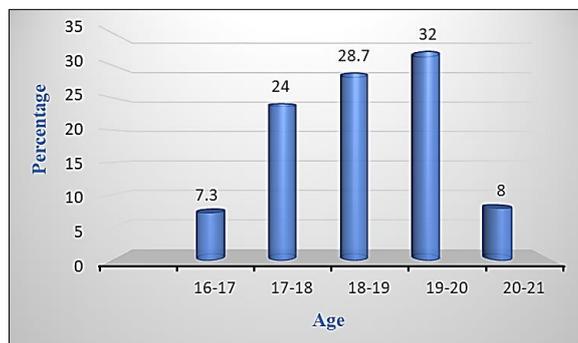


Fig 1: Distribution of adolescent girls according to age in years (n = 150)

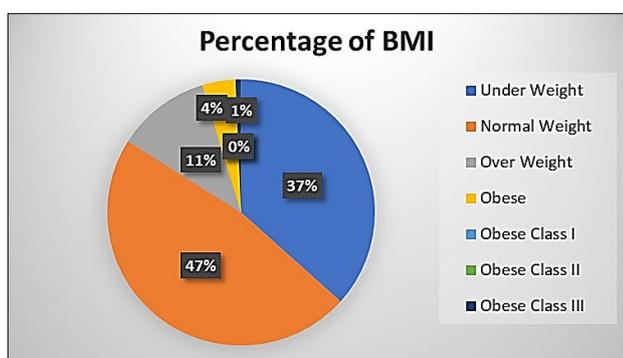


Fig 1: Distribution of adolescent girls according to BMI (n = 150)

The data shown in Figure 2 indicates the classification of adolescent girls according to their Body Mass Index. BMI is one of the best indicators to estimate the nutritional status of different age groups. From the WHO cutoff levels for BMI

were compared with obtained data and observed that 47 percentage of the young girls were having normal BMI range of 18.5 to 24.9 kgs/mt², while 37 per cent were undernourished with the BMI range of <18.5 kgs/mt². The percentage of girls who were classified as being Overweight, Obese and Obese Class I was 11, 4 and 1 per cent, respectively. None of the girls was in the category of Class II and Class III.

Parimalavalli and Sangeetha (2011) [5] reported that a cross - sectioned study was conducted focusing on 208 school going post- pubescent girls. Further, (17.4% and 25%) were normal and (20% and 37%) were obese. Similar to this study the outcomes of the current study also shown that 37 per cent were undernourished in the girls group.

Nutritional assessment by biochemical measures

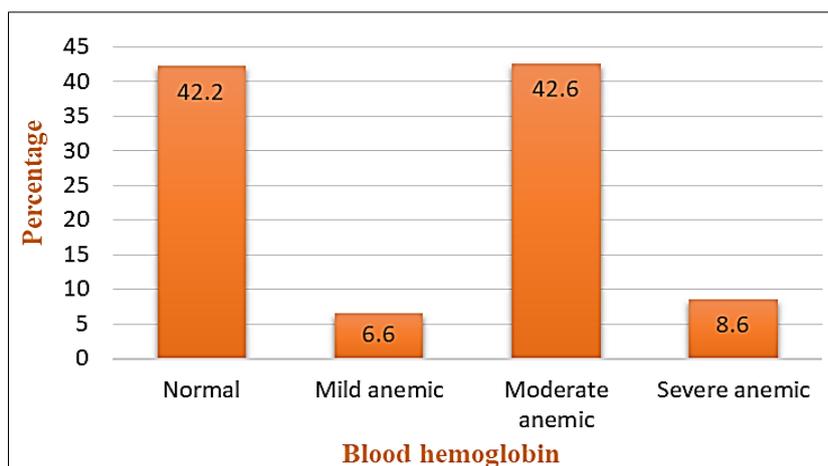


Fig 3: Distribution of adolescent girls according to blood hemoglobin levels (n = 150)

The data given in Figure No. 3 indicates the classification of adolescent girls according to their blood hemoglobin levels. Hemoglobin levels are the top indicators to diagnose the presence of anemia in pubescent girls. The data on blood hemoglobin readings in adolescents reveals that 6.6 percentage were mildly anemic, 42.6 per cent remained moderately anemic, 8.6 percentage were severely anemic

while only 42.2 percentage of the teen respondents were having normal hemoglobin levels.

The studies conducted on adolescent girls by (Reza *et al.*, 2008) [1] and (Neelam *et al.*, 2013) reported the incidence of anemia to be 44.2 per cent as iron deficient and 41.3 per cent as moderately anemic similar to the results obtained in our study.

The studies conducted on adolescent girls by (Reza *et al.*, 2008) [1] and (Neelam *et al.*, 2013) reported the occurrence of anemia remain 44.2 percentage as iron deficient and 41.3 per cent as moderately anemic similar to the results obtained in our study.

Siva *et al.* (2016) [6] stated that the frequency of moderate anemia was 55.9 per cent and that of severe was 10.1 per cent. Similar results were obtained in a study conducted among adolescent girls in Andhra Pradesh with prevalence of moderate anemia (39.33%) and that of severely anemic 9.33 percentage. Major usage with inclusive cutoff of SF, 20 mg/l a total of 170 graduate school girls (44.2%) were classified as iron deficient (Akramipour *et al.*, 2008) [1].

Assessment of clinical signs and symptoms for anemia

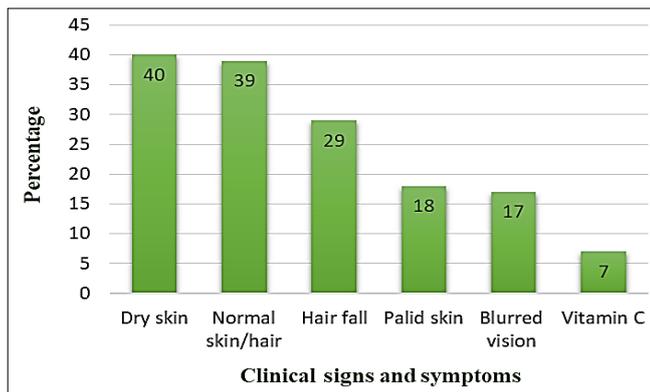


Fig 4: Distribution of adolescent girls according to clinical signs and symptoms (n = 150)

The data shown in Figure No. 4 indicates the classification of adolescent girls according to their clinical signs and symptoms. The data shows that the majority (40%) of them were suffering from dry skin, while 29 per cent were experiencing a problem with hair fall. Pallor is seen in 18 per cent of pubescent girls. Around 11 percentages of the girls indicated that having a blurred vision and ulcers in the mouth indicating probable deficiencies of vitamin A, B complex and vitamin C vitamins deficiency.

Nutritional assessment by 24-hour dietary recall method

The statistics on food consumption of adolescent girls were collected and the 24-hour recall menu thus collected was converted into nutrients by menu analysis and information was obtained on nutrient consumption per day. The results related to macronutrients consumption by adolescent girls is shown in Table 1.]

Table 1: Macronutrient intake of adolescent girls in comparison with RDA

Macronutrients	Daily diet average values	RDA values	% Adequacy
Energy (kcal)	1045	2060	51
Protein (g)	43	63	68
Fat (g)	28	22	127
Carbohydrates (g)	169	500	34

The data are given in Table No. 1 indicates that the consumption of energy from the regular intake of teen-age girls is 1045 kcal compared to RDA of 2060 kcal. The consumption of protein in the everyday diet of adolescent girls is 43 g when compared with RDA of 63 g. The

consumption of fat in daily intake of adolescent girls is 28 g when compared with RDA of 22 g. The nutrient consumption of carbohydrates from the regular diet of adolescent girls is 169 g compared to RDA of 500 g. The percentage adequacy calculated from these results shows that there is energy, protein and carbohydrate deficiency while fat consumption is more than what is recommended for their age group.

The study conducted by (Emily *et al.*, 2018) also reported that macronutrient intake of adolescents was significantly lower particularly for mean carbohydrates and protein was 254 ± 70 and 49 ± 4 g/day among rural adolescents.

Christian and Smith (2018) [2] reported that the nutrient requirements including those for energy, protein, iron, calcium, and others increase in adolescence which helps in adequate growth and development. The dietary intakes are suboptimal, anemia and micronutrient inadequacies are high. The average consumption of energy was 1239.6 kcal/day and the average protein ingestion was 39.5 g/day (Maliye *et al.*, 2010) [3].

The results related to micronutrients of adolescent girls are given in Table 2.

Table 2: Micronutrient intake of adolescent girls in comparison with RDA

Micro nutrients	Daily diet average values	RDA values	% Adequacy
Iron (mg)	6.55	30	22
Calcium (mg)	293	1300	58
Vitamin C (mg)	64.22	40	160

The data is presented in Table No. 2 and Figure No. 5 indicates that the mineral consumption of pubescent girls. Iron consumption from the regular diet of adolescent girls is 6.55 mg which is significantly low (P>0.01) compared to RDA of 30 mg. Calcium consumption from the diet was 293.18 mg which is significantly low (P>0.01) compared to RDA of 1300 mg and it is observed that the consumption of vitamin C was 64.22 mg which is significantly high (P>0.01) while compared with RDA of 40 mg.

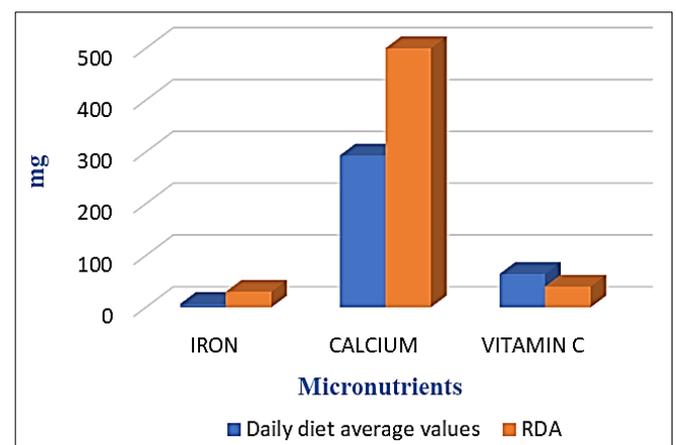


Fig 5: Micronutrient intake of adolescent girls in comparison with RDA

Seokarjo *et al.* (2001) stated that a lower socioeconomic status reflects a lower intake of iron-rich foods, especially sources of heme-iron. So, the Micronutrient intake of adolescents ought to be improved using supplements for all girls to treat anemia.

Milman (2019) [4] exposed the fact, that relatively low

consumption of iron may be a factor to the low body iron status. The nutritional intake of iron of 6.55 mg/d indicate very poor iron nutritional status in the study group. This situation has to be addressed probably through supplementation of iron rich foods for the selected group of girls.

Conclusion

The results showed that the majority of pubescent girls in the study group were eating diets low in calories, protein, carbohydrates, iron and calcium. Lack of iron in their daily diets is the reason for anemia. Most of them are undernourished and are moderately anemic. During adolescence, the body requires more nutrients like protein, calcium, iron, folate and zinc. Iron and folate are important during puberty. Nutrient deficiency is the reason for prevalence of malnutrition which will lead to greater prevalence of disorders among adolescents. So, the diet rich in nutrients have to be included to overcome the nutritional deficiencies. This situation has to be addressed probably through supplementation of iron rich foods for the selected group of girls.

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