

A Clinical study on Nutritional Health status of Adolescent Girls studying in Urban Government Schools

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ABSTRACT

Background: Adolescent nutrition is generally given less importance when compared to the under-five nutrition in developing countries like India. Particularly the adolescent female nutrition is important as the future of the society depends on the quality of life of these children. Nutritional problems like protein energy malnutrition (PEM), anemia and vitamin A deficiency continue to plague a large proportion of Indian children.

Aims and objectives: The major objectives of this study is to assess the health status of adolescent girls studying in urban school throwing light on the nutritional status of adolescent children, to know the prevalence of underweight, BMI, Anaemia and other nutritional deficiencies in adolescent girls and to counsel parents and sensitize authorities importance of adolescent nutrition.

Materials and Methods: A cross sectional study was done in six schools in a urban area of Southern part of India during September 2015 to February 2016. Height Weight, BMI, Hemoglobin levels were determined in the children of the age group of 10-17 years. A predesigned questionnaire and clinical examination were used to find out socioeconomic status and the factors associated with malnutrition and their implications.

Results: Most of the children are belonging to low socioeconomic group. Most common health problem found was anemia due to poor nutrition. And more than 80% children showed skin and hair changes and other signs of malnutrition.

Conclusion: Even though obesity and overweight are increasing in recent times; under nutrition is still prevalent in adolescent school children. Routine school health visits, improving female literacy, dietary modifications, imparting health as well as physical education are the need of the hour to avoid malnutrition in adolescent school children. Prophylactic Iron supplementation should be started to all adolescent female children of low socio economic group for prevention of anemia.

Keywords: Adolescent girls, nutritional problems, anemia

INTRODUCTION

Malnutrition continues to be a major contributor of poor quality of life in large proportion of children in India. In the second National Family Health Survey (NFHS-4) report, almost half of children under three years of age (46%) were underweight, and a similar percentage (34%) was stunted.^[1]

Data for the prevalence of malnutrition in adolescent age group is lacking, particularly vulnerable are low socioeconomic group children studying in urban schools. Rapid urbanization in the 20th century has been

accompanied by the development and influx of daily wage workers who settle in slums with families. Data of these children regarding nutritional status and its associated factors is not present.^[2]

Adolescence is a critical phase in the life cycle of human beings. Rapid rate of growth occurs in this phase and it is a transition from childhood to adulthood. Hence adequate nutrition is essential for this spurt of growth. Adolescence is also considered as a second chance for growth or catch up growth for those children who had undergone deficits in nutrition in their early life.^[3,4] Adolescents contribute

to approximately 21.4% of Indian population (National Youth Policy 2014).^[4] A lot of studies have been done on the nutritional status of children in the under-five age group. As data on nutritional status of adolescents and particularly girls are lacking, we focused our study on this group.

MATERIALS AND METHODS

This cross-sectional study was done in an urban area of Southern part of India during September 2015 and February 2016, after obtaining clearance from the institutional ethical committee.

Six schools in the urban area were selected by simple random sampling. Female children in the age group of 10-17 years in these schools were included in the study. They were divided into four groups 10 years, 11-12 years, 13-14 years and 15-17 years by stratified random sampling. Children suffering from chronic and congenital diseases were excluded.

Informed consent was obtained from the principals of all selected schools, children and their parents. Children were made to stand straight without footwear, with hands hanging by the side, feet parallel and with the heels, gluteal region, shoulders and occiput touching the wall. Height was measured using a stadiometer with a near accuracy of 0.5cm. Children were instructed to stand on the dial type bathroom weighing scale looking straight without footwear with feet apart. Weight was measured to the nearest 0.5 kg.

Body mass index was calculated using the formula: BMI = Weight in kg / Height in metre.^[2]

Detailed clinical examination was done to find out various nutritional deficiency and other disorders. Anemia was diagnosed based on clinical examination and categorized on the basis of Hb value. Hemoglobin estimation was done using Sahli's method. And categorization of anemia was done according to WHO criteria.

Table 1: WHO Anaemia Classification

Age	Normal (gm/dL)	Anemia(gm/dL)		
		Mild	Moderate	Severe
6-59 months	>11.0	10.0 - 10.9	7.0 - 9.9	<7.0
5 - 11 yrs	> 11.5	11.0 - 11.9	8.0 - 10.9	<8.0
12 - 14 yrs	> 12.0	11.0 - 11.9	8.0 - 10.9	<8.0
Above 15 yrs (non pregnant females)	> 13.0	10.0 - 10.9	7.0 - 9.9	<7.0

STATISTICAL ANALYSIS

Comparison of continuous variation was by one way

ANOVA and proportions by Chi-squared test. Logistic regression analysis was carried out to examine the relationship between socio economic status, gender & age with overweight or obesity. Analysis was done using windows based SPSS statistical package 19.0.

RESULTS AND DISCUSSION

A total of 359 female students were studied. Among them, 20 children (5.5%) were in the age group of 10 years, 102 (28.4%) were in the age group of 11-12 years, 156 (43.5%) were in the age group of 13-14 years and 81 (22.6%) were in the age group of 15-17 years. All the students belong to low socioeconomic group.

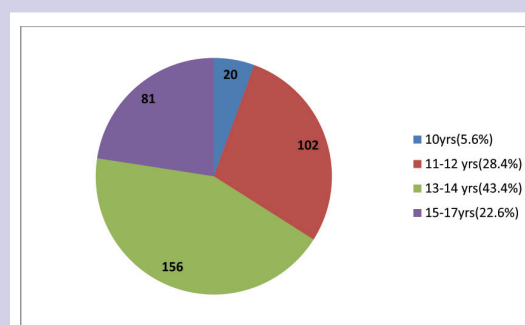


Figure 1: Age distribution of children under study

Height distribution in the study group in 10yrs showing less than the mean height as per Indian standards of 132.9+ 6.8 cms and similar pattern is seen in other age groups which are below the average Indian standard height for that age.

Table 2: Age and Height distribution in study population

Age	Height (centile)					Total
	< 3 rd	3 rd - 50 th	50 th - 75 th	76 th - 97 th	>97 th	
10 yrs	7	13	-	-	-	20
11-12 yrs	19	42	31	10	-	102
13-14 yrs	25	131	-	-	-	156
15-17 yrs	4	77	-	-	-	81
Total	55(15.3%)	263(73.3%)	31(8.6%)	10(2.8%)	-	359

Table 3 : Age and weight distribution in study population

Age	Height (centile)					Total
	< 3 rd	3 rd - 50 th	50 th - 75 th	76 th - 97 th	>97 th	
10 yrs	12	6	-	2	-	20
11-12 yrs	31	67	4	-	-	102
13-14 yrs	22	115	19	-	-	156
15-17 yrs	19	62	0	-	-	81
Total	84(23.4%)	250(69.6%)	23(6.4%)	2(0.6%)	-	359

Table 4 : BMI status in study population.

BMI	No. of children				
	10 yrs	11-12yrs	13-14yrs	15-17yrs	Total
<18.5	19	53	63	41	176(49%)
18.6 – 23	1	36	7	6	119(33.1%)
23.1 – 25	0	7	21	12	40(11.1%)
>25.1	0	6	13	5	24(6.8%)
Total	20(5.6%)	102(28.4%)	156(43.5%)	81(22.5%)	359

Table 5: Hb status of children in relation to Age and Sex.

Age	Hb (gm/dL)				Total
	<7	7.1-10	10.1-12	>12.1	
10 yrs	2	14	4	0	20
11- 12 yrs	14	23	58	7	102
13 – 14 yrs	12	49	71	24	156
15 – 17 yrs	13	31	29	8	81
Total	41(11.4%)	117(32.6%)	162(45.1%)	39(10.9%)	359

Table 6 : Distribution of study population in terms of grading of anemia(as per WHO)

Hb Level	Children (%)
Normal (>12gm%)	39 (10.9%)
Mild Anemia (10-11.9 gm%)	162 (45.1%)
Moderate Anemia (7-9.9 gm%)	117 (32.6%)
Severe Anemia(<7gm%)	41 (11.4%)

Weight for age in the study group shows lower weight in all the age groups than the mean weight as per Indian standards.

In our study the prevalence of overweight was 6.8% which was similar to Selvaraj et al in semi urban area of South India.^[5] Uma Iyer zxet al in Vadodara noted the prevalence of both obesity and overweight as 20.3%.^[6] Jagadeshnan et al in Chennai noted over weight as 11.6% and obesity as 3.4%.^[7]

The prevalence of underweight in our study group consists as 49%. Prashant. K et al has noted 42.6% in urban slum areas in South India.^[8] A similar study conducted in urban slums of Varanasi depicted 70.0% adolescent girls has BMI <20. The difference observed may be attributable to small sample size of 70 adolescent girls.

BMI is an age independent anthropometric criteria. it is an indicator of acute undernutrition, the result of more recent food deprivation and / or illness. underweight is used as a composite measure to reflect both acute and chronic under nutrition, although it cannot distinguish between them.

Out of the 359 adolescent girls in the study population, 320 (89.1%) girls were found to be anemic.11.4% are severely anemic while majority (77.7%) were mild to moderately anemic. Overall mean hemoglobin levels was 10.1+ 1.4 gm/dL. Toteja etal and Kulkarni etal ^[9,10] reported 90.1 % prevalence of anemia among adolescent girls which is similar to present study. Gawarika etal found 96.5% anemic adolescent girls which is more than present study.^[11] A variable prevalence (23.9%- 81.8%) of anemia in adolescent girls has been reported in different studies. a maximum number of girls in the present study were from low socioeconomic class and this may be the reason for such finding of this study.

A project by National Institute of Nutrition in India concluded that the prevalence of multiple subclinical micronutrient deficiencies is high in Indian school children and that daily consumption of micronutrient enriched beverage had positive effects that were confined to those nutrients that were inadequate at baseline.

CONCLUSION

The study showed that the prevalence of anemia and undernutrition is common in adolescent girls of urban area. This probably puts the community at greater risk as these adolescent girls were approaching marriageable age and will bear children may give birth to LBW babies.

There is an urgent need to develop interventional programmes with special emphasis on urban areas in form of nutritional supplementation along with prophylaxis of iron & folic acid tablets and regular deworming for prevention of anaemia. There is a need for regular nutritional & health education sessions should be carried to increase awareness in adolescent girls regarding undernutrition, anemia and menstrual hygiene. As the secondary board included the health education in their curriculum, it is important to reinforce practical importance of nutritional management of health and hygiene.

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CONFLICT OF INTEREST :

The authors declared no conflict of interest.

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