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# Anemic Status of Rural Adolosecent Girls (13-15) years in Selected Villages of Coimbatore

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## ABSTRACT

Adolescent has been defined by the WHO as the period of life spanning the ages between 10 - 19 years. This is the formative period of life when the maximum amount of Physical; Psychological and Behavioral changes take place. Adolescents in India represent over 1/5th (22.3percentage) of the total population. Iron deficiency anemia is the commonest medical disorder and is a problem of serious public health condition with epidemic proportions. Among adolescents, girls constitute a vulnerable group particularly in developing countries where they are traditionally married at an early age and exposed to a greater risk of reproductive morbidity and mortality. The nutritional status of adolescent girls, the future mothers, contributes significantly to the nutritional status of the community. Objectives: The present study was aimed to assess the Prevalence of Anemia among Rural Adolescent girls (13-15 years) in Selected Villages of Coimbatore. Materials and Methods: Background Information of Rural Adolescent girls (13-15 years) were collected through structured Pre-tested Questionnaires through personal interview method. The Anthropometric parameters were assessed using standard procedures and the BMI, WHR was calculated. They were clinically assessed for signs and symptoms for Nutritional Deficiency Disorder using Jellief Table. Hemoglobin estimation was done by Cyanmethemoglobin Method. Results: Prevalence of anemia was found to be very high of 89 percentages among rural adolescent girls of Coimbatore. Majority of the girls were found to be moderately anemic of 54percent. Fifty seven percent of Adolescent girls were found to be under weight with the mean BMI less than 18.5. Waist to hip ratio indicated a risk of being obese for 55 percentages of Adolescent girls.

**Key Words:** Anemia, Adolescence, BMI

## INTRODUCTION

Adolescence is a period of transition when the individual changes physically and psychologically from a child into adult. Adolescents aged between 10-19 years account for more than one fifth of the world's population (21.4 percentages) and unfortunately adolescent girls are a neglected sector of the population of our country. Adolescent girls are very important section of our society as they are our potential mothers and future feeders of Family.

Several factors such as socioeconomic status, environment, attitude towards girl babies and adolescent girls, ignorance with regard to nutritional requirement, hygiene and illness are responsible for the present nutritional status of adolescent girls. Adolescent girls are in general vulnerable to a spectrum of Nutritional disorders and anemia being the major threat for this population.

Iron deficiency anaemia (IDA) is most prevalent and severe in pregnant women, young children and adolescent girls. Seventy percentages of the adolescent girls are anaemic in India according to studies. Lack of haemopoietic factors such as ascorbic acid, folic acid, vitamin B12, protein, beta-carotene, vitamin B6, copper and zinc may lead to nutritional anaemia.

On an intense literature search most of the prevalence studies on iron deficiency anaemia were carried out in northern states of India and only few studies were conducted at the southern part of India. Though the nutritional status of adolescent girls in the state of Tamil Nadu is poor in general, data on the prevalence of anaemia among rural adolescents in particular is scarce. In Tamil Nadu, 1-10 per 100 adolescent girls are prone for anemia and in Coimbatore -a city in Tamil Nadu, 1-10 per 19 adolescent girls are anemic. Since there is dearth of statistical information on the prevalence of anaemia among the rural part of Coimbatore.

## OBJECTIVES

- \* To study the anthropometric, clinical and Morbidity status of selected rural adolescent girls
- \* To assess the prevalence of anaemia

## MATERIALS & METHODS

The methodology of the current study is as followed,

### Study design

A cross sectional, Community based, Experimental study was undertaken at different schools in rural areas of Coimbatore District, Tamil Nadu, India. Coimbatore has four taluk with 163 revenue villages out of these 16 villages were selected by Simple Random sampling comprising four villages under each taluk. A Random Number Table was utilized for this purpose.

### Sample size and sampling procedure

Two thousand adolescent girls between the age group of 13-15 years doing their schoolings were selected by convenient sampling. Though the age of adolescent girls is 10-19 years, this period is the last chance to correct the growth lag and malnutrition. Correction of nutritional problem at a young age can not only meet out the nutritional demands of growth spurt but can also create a scope for future follow up studies. Hence adolescent girls between the age group of 13-15 years were selected for the study. The study was carried out for six months by obtaining the following data.

### Demographic profile

General information such as name of the respondent, address, age, education, type of family, family size, occupation and family monthly income was collected by a structured pretested questionnaire through personal interview method.

## b. Assessment of nutritional status of the adolescent girls

- ☆ Nutritional anthropometry
- ☆ Clinical examination
- ☆ Haemoglobin assessment
- ☆ Nutritional anthropometry

The anthropometric measurements viz., height, weight, and waist to hip ratio were measured as per guidelines suggested by using standards<sup>2</sup>. The height was measured by using a height scale nearest to 0.1 m. Portable personal weighing scale was used to measure the weight in kilograms nearest to 0.5 kg, with ordinary casual clothing and without shoes. Waist and hip circumference were measured by using a fibre glass measuring tape in centimetres.

### Body Mass Index

The anthropometric measurement of the adolescent girls was used for calculating the Body Mass Index which was expressed as ratio of weight (kg) to height in metre square.

$$\text{BMI} = \text{Weight (kg)} / (\text{Height (m)})^2$$

Further, the individuals were classified into different classes based on the classification of as follows

BMI classes Presumptive diagnosis	
< 18.5	Under weight
18.5 - 22.9	Ideal BMI
>23.0	Over weight
25.0	Obese grade I
>30	Obese grade II

### Waist to Hip Ratio

Waist to Hip ratio was computed using the Waist and Hip circumference. The abdominal obesity was identified by using the reference ratio for female<sup>4</sup>. (At risk >0.85 No risk <0.80).

- ☆ Clinical examination

To assess the prevalence of anaemia, clinical features observed and experienced by the subjects, Jelani's<sup>5</sup> method of clinical assessment was used. Further, the number of symptoms experienced by each individual were counted and percentage was calculated<sup>5</sup>.

- ☆ Laboratory analysis

### Haemoglobin assessment

The haemoglobin levels in the blood were measured for all the 2000 adolescent girls by Cyanmethemoglobin method. According to this method 20% blood were mixed with 5 ml Drabkin's solution and vortexed to convert all hemoglobin into Cyanmethemoglobin. The concentrations of haemoglobin were determined by comparison with a known standard in a colorimeter. Based on the hemoglobin content the adolescent girls were identified for the presence of mild, moderate and severe anaemia according to WHO classification<sup>6</sup>.

Classification (g/dl) Category	
>12	Normal
10 - 12	Mild anaemic
7 - 10	Moderate anaemic
<7	Severe anaemic

Hemoglobin estimation was done after taking written consent from the school authorities and the parents of the selected subjects.

## Results and Discussion

### Demographic profile

Among 2000 Rural Adolescent girls studied 44 percentage were in the age group of 13 years. Followed by 33 percentage of rural adolescent girls in the age group of 14 years and 23 percentage were in the age group of 15 years.

Table: I

Occupation Status of the Parents				
Type of occupation	Father		Mother	
	No.	Percent	No.	Percent
Labour	1360	68	581	29
Clerical job	198	10	91	4
Professor	6	1	25	2
Business	323	16	1242	62
Others	73	3	49	2
Unemployed	40	2	12	1
Total	2000	100	2000	100

From the above it is clear that 68 percentage of Father's and 29 percentage of mother's were working as a Labour. At the same time 40 percentage of father's were found to be unemployed and 23 percentage of mother's were found to be house wives. Thus this table clearly indicates a poor occupational status which may lead to poor earning and an associated poor nutritional status subsequently.

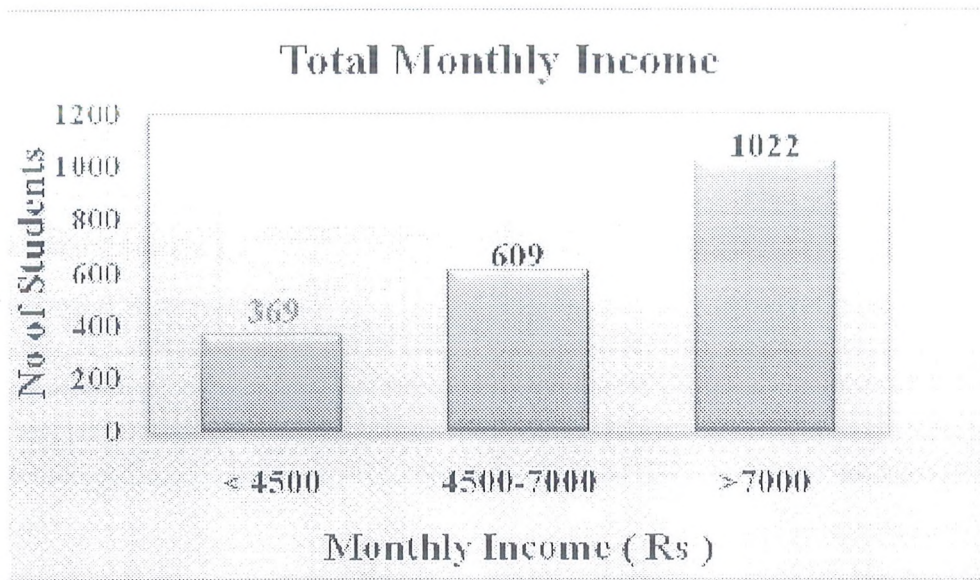


Figure 1

Total Monthly Income

Out of 2000 Adolescent girls (Fig., 1), Eighteen percentage of the rural adolescent girls were found to be in low income group with monthly earning less than Rs.4500 and 31 percentage of children's father earned between Rs. 4500- 7000 per month. The above observation clearly reflects a poor purchasing power of the subjects.

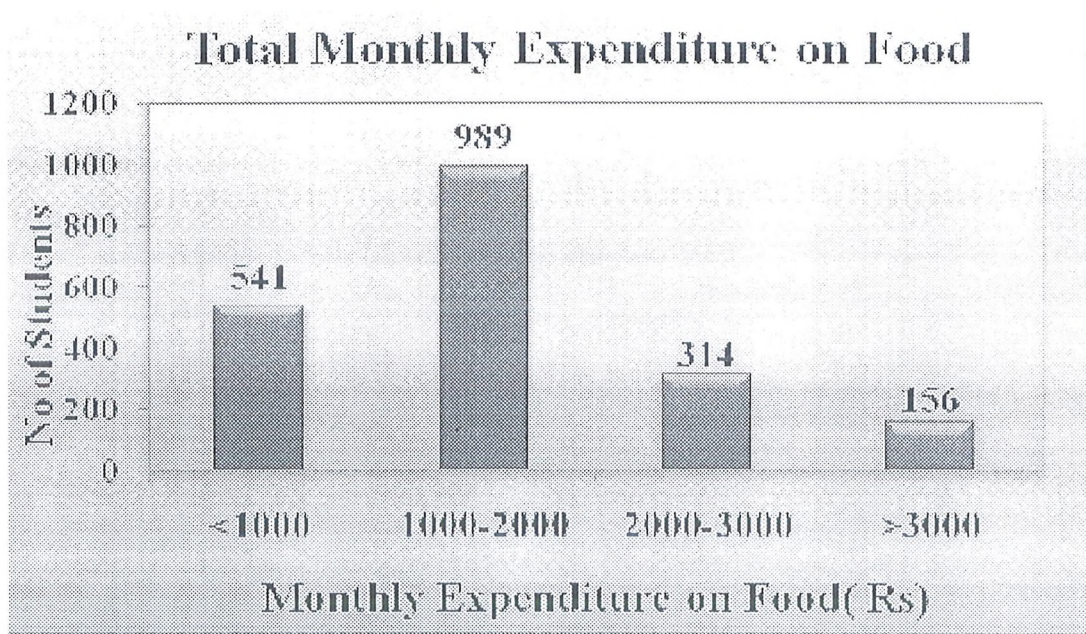


Figure 2

Total Monthly Expenditure on Food

From the above Figure (2) it is clear that the monthly food expenditure of 27 percentages of adolescent girls were found to be less than Rs 600 / month indicating a poor food intake. Also only eight percentages of the selected adolescent girls had food expenditure more than Rs. 3000 / month. From the above observation it is evident that selected adolescent girls in these rural areas generally as poor intake which is clearly associated with their earning capacity.

### Anthropometric Measurements

Table II

BMI of Adolescent girls

BMI Cut off	No.	Percent
Under Weight (<18.5)	1143	57
Ideal BMI (18.5-22.9)	658	33
Over Weight (>23.0)	113	5
Obese Grade I (>25.0)	75	4
Obese Grade II	11	1
Total	2000	100

Fifty seven percentage of adolescent girls were found to be under weight with the mean BMI less than 18.5 (Table II). Also five percentage of rural adolescent girls were found to be obese.

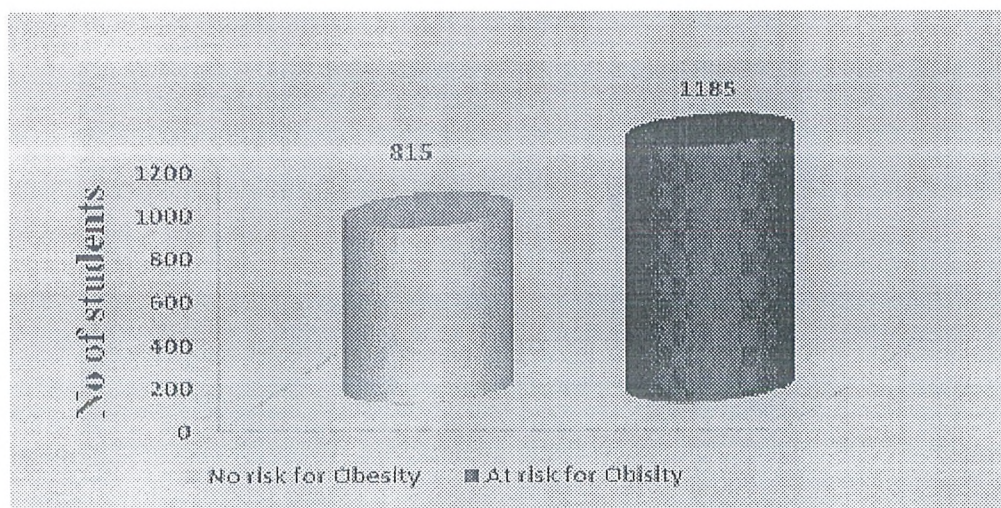


Figure 3

Waist to Hip ratio of Adolescent girls

Waist to hip ratio indicated a risk of being obese for 59 percentage of adolescent girls (Fig., 3).

## Conclusion

The Prevalence rate of 54% of Moderate and 23% of Mild anemia among the selected rural adolescent girls at Coimbatore calls for a holistic Nutritional supplementation and, maintenance program to improve the nutritional status of these under privileged children.

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## Clinical Symptoms

Table III

Clinical Symptoms of Adolescent girls	
Symptoms	Number
Fatigue	95
Poor Immunity (Frequent episodes of infection)	879
Poor muscle Mass	1143
Easily pluckable hair	346
Pale congitivities	300
Dental carries	222

Based on the clinical observation (jelliffe table of clinical asesment) 1143 adolescent girls were found to be having poor muscle mass. Poor immunity was observed among 879 rural adolescent girls. Easily pluckability of hair and pale congitivities - a classical symptom of anemia was observed among 346 and 300 rural adolescent girls respectively (Table III).

### Prevalence of Anemia among the selected Adolescent girls

Table IV

Prevalence of Anemia among Adolescent girls		
Hb level	No.	Percent
Severe	239	12.0
Moderate	1080	54.0
Mild	458	23
Normal	223	11
Total	2000	100

From the table IV it is clear that Out of 2000 adolescent girls in the study population (89 percentage) girls were found to be anemic. Majority of the girls (77 percentage) were found to be mild to moderately anemic. The prevalence of anemia among the rural adolescent can be attributed due to poor socio economical status, poor immunity and poor food consumption in general.

A similar observation was recorded by (Jolly et al., 2000). Where he observe a prevalence of 44 percentage of anemia among rural adolescent population7.