

# Nutritional status of adolescent tribal girls: A community based study

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## Abstract

**Back ground:** Adolescence age group is 10-19 years; according to World Health Organization definition. Adolescent age people feel a sense of independence, but depend on adults for their material needs. *This phase of life cycle is marked by special characteristics which include rapid physical growth and development, social, sexual and psychological maturity, onset of sexual activity and reproduction cycle, experimentation, development of adult mental processes, adult identity and transition.* Anaemia is a widely prevalent health problem among adolescent girls. Both the 1992 ICMR study on Iron and Folic Acid supplementation and UNICEF have reported low mean haemoglobin levels and low nutritional intake of proteins, calories, and macro/micronutrients among adolescent girls and pregnant mothers. Poor nutrition is the preliminary cause that leads to poor physical growth and stunting. The NFHS-3 reported that the prevalence of anaemia was highest (56 %) among adolescents (ages 15–19) compared with other group of women in reproductive age.

**Materials and Method:** To evaluate nutritional status in tribal adolescent girls through anthropometry. To assess haemoglobin status of study subjects Calculated sample size 425, total adolescent girls in 18 habitations are 1572, every 4<sup>th</sup> adolescent girl who was available taken for the study by using systematic random sampling method. **Results:** Majority of the study subjects (59.1%) were from Lambadi tribe, followed by Chenchu (35.8%) and Yerukala (5.2%). Mean height was observed to be less than that of 50<sup>th</sup> percentile (according to NCHS standards) in the respective age. Stunting was observed in younger age group i.e. 10-13 years (17.4%) and it was found to be statistically significant. In present study 44% were anemic with mean Hb of 12.05 and 56% had normal haemoglobin levels (>12 gm/dl), 38.1% were mildly anemic and 5.9% moderately anemic. There were no severe cases of anaemia. **Conclusion:** In the present study, we have observed that tribal adolescent girls height and weight were low compared to national standards. Their nutritional status is deprived and majority were anaemic. In depth studies and rigorous health interventions are needed to address these problems.

**Key Words:** Height, Weight, BMI, Anemia.

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## INTRODUCTION

Adolescence age group is 10-19 years; according to World Health Organization definition.<sup>1</sup> Adolescent age people feel a sense of independence, but depend on adults

for their material needs. *This phase of life cycle is marked by special characteristics which include rapid physical growth and development, social, sexual and psychological maturity, onset of sexual activity and reproduction cycle, experimentation, development of adult mental processes, adult identity and transition.*<sup>2</sup> Anaemia is a widely prevalent health problem among adolescent girls. Both the 1992 ICMR study on Iron and Folic Acid supplementation and UNICEF have reported low mean haemoglobin levels and low nutritional intake of proteins, calories, and macro/micronutrients among adolescent girls and pregnant mothers. Poor nutrition is the preliminary cause that leads to poor physical growth and stunting. The NFHS-3 reported that the prevalence of anaemia was highest (56 %) among adolescents (ages 15–19) compared with other group of women in reproductive

age.<sup>3</sup> Ministry of Health and Family Welfare at central level and the Department of Health and Family Welfare at state level looks after adolescent age health problems. The Ministry of Women and Child Development is involved in the issues of nutrition and development of children, especially girl child. In the National Population Policy 2000 first time major importance was given for adolescent age group. The National Youth Policy, 1986 (New Draft National Youth Policy, 2000) formed for adolescent health.<sup>4</sup> In Telangana, adolescent girls constitute approximately 5.03% of the population. The importance of this group lies in the fact that they are going to be the mothers of tomorrow – whose well being is critically important for improving the nutritional, health and educational status of women in the State. Various base line surveys also revealed that the health, nutritional and educational status of adolescent girls were at sub-optimal level especially in tribal population.<sup>4</sup> Frequent pregnancies, early marriage, early pregnancy and poor nutrition aggravate and exacerbate anaemia producing deleterious consequences that extend over generations. Girls born underweight are at risk of giving birth to small premature infants. It becomes a vicious cycle of anaemic girls giving birth to anaemic infants who then become future anaemic mothers.<sup>5</sup>

**MATERIALS AND METHOD**

**Objectives:** To evaluate nutritional status in tribal adolescent girls through anthropometry. To assess haemoglobin status of study subjects. Calculated sample size 425, total adolescent girls in 18 habitations are 1572, so 1572/425=3.69, every 4<sup>th</sup> adolescent girl who was available taken for the study by using systematic random sampling method. Pre designed, pre tested, pre coded schedule was used. Nutritional status was assessed by anthropometric measurements like height, weight, BMI, biochemical markers viz haemoglobin estimation. Haemoglobin estimation was done by Sahli’s method. The WHO cut off levels were taken as standards to classify the haemoglobin status.

**RESULTS**

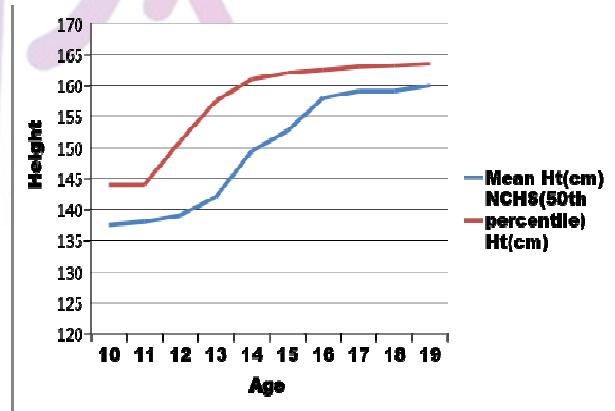
In the present study a total of 425 subjects in the age group of 10-19 years from 18 habitations were included. Majority of the study subjects (59.1%) were from Lambadi tribe, followed by Chenchu (35.8%) and Yerukala (5.2%). Majority of the parents were illiterate. Mothers were more illiterate (60.5%) than fathers(52.5%). 33.9% of mothers completed less than primary school education whereas, 32% fathers of subjects were only able to read and write their names. 5.6% mothers completed primary school and 0.04% high school. 12.2% fathers completed primary school and

3.3% high school. Majority of the subjects (41.2%) had education up to primary school, 22.8% less than primary school, 6.4% upto high school and 4% up to intermediate. 25.9% were illiterates. Out of 425 subjects 170(40%) were students followed by 128(30.1%) homemakers, 60(14.1%) employed for wages, 48(11.3%) were occupied with agricultural work and 19(4.5%) self employed. Out of 425 subjects 29(6.8%) had conception for the first time with the mean age of 16.9years. Conception by the age of 17years was seen in 41.4%, by 18years in 37.9% and by 15years in 20.7%.

**Table 1:** Mean height of subjects compared with NCHS standards

Age	Number	Mean ± S.D Ht(cm)	NCHS(50 <sup>th</sup> percentile) height in cm
10	28	137.52±3.11	144
11	43	138±3.27	144
12	62	139.04±3.22	151
13	45	142.02±3.28	157.5
14	73	149.41±1.39	161
15	71	152.68±4.45	162
16	14	158.0±1.9	162.5
17	30	159.08±1.97	163
18	41	159.09±1.80	163.2
19	18	160±1.7	163.5

In the present study the mean height was observed to be less than that of 50<sup>th</sup> percentile (according to NCHS standards) in the respective age.



**Figure 1:** Height according to age

**Table 2:** Mean weight of subjects compared with NCHS standards

Age	Number	Mean Wt(Kg) ± S.D	NCHS(50 <sup>th</sup> percentile) weight in cm
10	28	32.4±2.87	37
11	43	32.43±2.9	37
12	62	32.51±2.97	42
13	45	33.43±2.9	46
14	73	40.84±3.5	49
15	71	43.2±4.2	52
16	14	47.08±2.09	54
17	30	47.11±2.06	55.3
18	41	47.21±1.98	56.2
19	18	47.26±1.94	57.2

It was observed in the present study that the mean weight increased with age and it was found to be less than that of 50<sup>th</sup> percentile (according to NCHS standards).

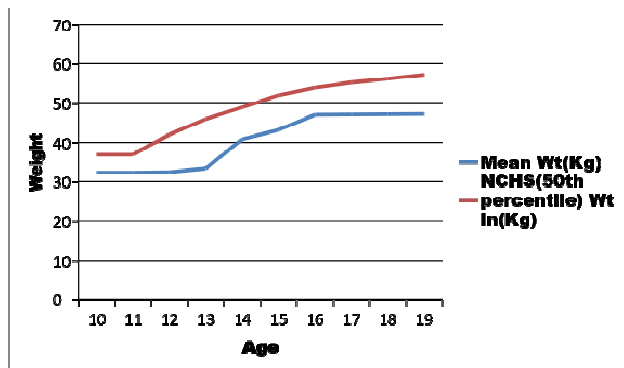


Figure 2: Weight according to age

Table 3: Prevalence of stunting of study subjects.

Age	Number	Stunting	
		No.	percentage
10-13	178	31	17.4%
14-15	144	6	4.2%
15-19	103	4	3.8%

Chi square =30.5 P value-<0.05

Stunting was observed in younger age group i.e. 10-13 years (17.4%) and it was found to be statistically significant.

Table 4: Distribution of subjects according to BMI staging

BMI staging	No.	Percentage
<18.5 (Under Weight)	259	60.1%
18.5-22.2 (Normal)	166	39.1%
23-24.99 (Pre obese)	Nil	Nil
>25 (Obese)	Nil	Nil
<b>Total</b>	<b>425</b>	<b>100%</b>

Majority (60.1%) of the adolescent girls were under weight i.e. less than 18.5 BMI. 39.1% with normal BMI. There were no pre obese and obese girls in study population.

Table 5: Grading of Hb of study population according to WHO criteria

Hb( gm/dl)	No.	Percentage
Normal(>12)	238	56%
Mild anaemia (10-11.99)	162	38.1%
Moderate (7-9.99)	25	5.9%
Severe (<7)	Nil	Nil
<b>Total</b>	<b>425</b>	<b>100%</b>

In present study 44% were anemic with mean Hb of 12.05 and 56% had normal hemoglobin levels (>12 gm/dl), 38.1% were mildly anemic and 5.9% moderately anemic. There were no severe cases of anaemia observed.

Table 6: Anaemia according to age of adolescent girls

Age	Anaemia	P value
10-13	93(52.24%)	
14-15	41(28.47%)	<0.05
16-19	53(51.45%)	

Anaemia was in 10-13 years age group and this was statistically significant.

## DISCUSSION:

The mean weight of subjects ranged from  $32.4 \pm 2.87$  kg to  $47.26 \pm 1.94$  kg and the mean height from  $137.52 \pm 3.11$  cm to  $160 \pm 1.7$  cm. The weight and height were low when compared to NCHS standards according to their respective age. In a study done by Srinivasan K *et al*<sup>6</sup> in Tirupati, the mean weights and heights of both boys and girls were found to be below NCHS standards and the prevalence of malnutrition was 78.4%. In another study by Banerjee A LC *et al*<sup>7</sup> in school children, the heights and weights were below NCHS (50th percentile) standards, 31.7% were under weight and 7.02% were of short stature when compared to 5th and 3rd percentiles of NCHS. Das DK *et al*<sup>8</sup> in his study done in West Bengal noted that 37.8% had stunted growth. Varsha Zanvar *et al*<sup>9</sup> of Marathwada region, found weights, heights and BMI below the NCHS standards. In another study by Medhi GK *et al*<sup>10</sup> 52% of girls were found stunted and 41% were thin when compared to NHANES standards. Studies by Joseph G *et al*<sup>11</sup> in rural south India, Begum MR<sup>12</sup> in Thiruvananthapuram reported heights and weights less than NCHS standards, whereas Singh J *et al*<sup>13</sup> in Lucknow in his study reported height and weight less than ICMR standards. Wadke R *et al*<sup>14</sup> in his study conducted in Maharashtra found 67.8% to be underweight according to WHO Asian Pacific BMI criteria. Medhi GK *et al*<sup>10</sup> in his study on adolescents of tea garden workers found median BMI to be far below NCHS median and overweight was detected in only 2 adolescents (0.33%). In the present study according to WHO BMI staging 60.1% were having chronic energy deficiency (CED), 39.1% were normal, 0% obese and 0% preobese. In a study by Begum MR<sup>12</sup> in Kerala, 53% in 14 years age group and 33% in 15 years age group were having BMI <18.5. In the present study 44% of girls were anaemic of which 38.1% had mild, 5.9% moderate and none had severe anaemia. The mean haemoglobin was  $12.05 \pm 1.19$  gm/dl. Similar prevalence of anaemia was observed in studies by Aneja S *et al*<sup>15</sup> (47%), Das DK *et al*<sup>8</sup> in West Bengal(44.8%), Singh J *et al*<sup>13</sup> in slums of Lucknow (56%), Varsha Zanvar *et al*<sup>9</sup> in marathwada region (46.6%) and Wadke R *et al*<sup>14</sup> in Maharashtra (42%). High prevalence of anaemia was found in studies by

Swapna Chaturvedi *et al*<sup>16</sup> in Rajasthan (73.7%), Srinivasan K *et al*<sup>6</sup> in Tirupathi (80.4%), Trivedi P *et al*<sup>17</sup> in adolescent school girls (82%) and TR Behera *et al*<sup>18</sup> in Orissa (72.7%). This high prevalence when compared to present study may be due to inadequate iron intake and relatively high incidence of worm infestation in those regions.

In the present study the mean haemoglobin in menstruating girls (12.05±1.2gm/dl) is more than that of non-menstruating girls (11.7± 0.8 gm/dl), this is in concurrence with the study findings of Choudhary S *et al*<sup>19</sup>, who in rural Varanasi found mean haemoglobin of menstruating girls (12.65 ± 1.3 g/dl) more than that of non-menstruating girls (12.10 ±1.21 g/dl).

## CONCLUSION

In the present study, we have observed that tribal adolescent girls height and weight were low compared to national standards. Their nutritional status is deprived and majority were anaemic. In depth studies and rigorous health interventions are needed to address these problems.

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