# A STUDY ON GROWTH STATUS OF HIGH SCHOOL CHILDREN IN RURAL SOUTH INDIA

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**ABSTRACT: OBJECTIVE**: To assess the growth status of High school children in Rural Primary health centre area of South India. **METHODS:** Children from various High schools aged between 13 to 16 years belonging to a PHC area were surveyed in a School Health Program. Height and weight was measured following standard procedures. General nutritional status was assed clinically. SPSS Version 16 was used to analyze the data. **RESULTS:** 630 students were examined. The overall prevalence of stunting was 44.6%. It was significantly higher in boys (47.7) than girls (41.6). Around 71% of the students were underweight, Boys (77.3%) were significantly underweight as compared to girls (64.6). 21% of the children showed signs of malnutrition. **CONCLUSION:** The nutritional status of high school children in Rural Field Practice area is poor compared to many other studies.
**KEY WORDS:** High school Children; Underweight; Stunting, Nutrition.

**INTRODUCTION:** The health and growth of adolescents has attracted global attention in the last two decades[1]. This period is known to be a second chance for growth for those children who have experienced a nutritional deficit in their early life[2, 3]. During this period 35% of adult weight and 11-18% of adult height are acquired.[4] Short stature in adolescence resulting from chronic under nutrition is associated with reduced lean body mass and deficiency in muscular strength and work capacity[4].

Anthropometric assessment is a simple tool to study the nutritional status of the community at large. It serves as the most useful screening test especially in developing countries of the world, where malnutrition is widely prevalent and the resources are limited[5]. In India alone there are approximately 60 million children who are underweight[6] and the prevalence is higher in rural areas compared to urban areas[7].

The condition of being underweight may have resulted from a) low dietary in-take b) excessive work out c) chronic infections[8]. Thus this study was done in rural area to know the current status of growth and nutrition in high school children.

**MATERIAL AND METHODS:** The present study was conducted in the Rural Health Block, Kanasawadi Primary health Centre attached to the Department of Community Medicine, SIMS & RC, Bangalore.

A total of four Government and Private high schools were included for the study. School children present on the date of examination were included. The age of the children was determined using school records. Height and weight were measured using standard protocol.

**Weight:** Measured using a floor type weighing scale with due respect to the standardization of the equipment and procedure. The measurements were taken to the nearest 1 Kg.

**Height:** was taken using a measuring tape applied to the wall. The measurements were taken with children barefoot with their back of heels, buttocks and head touching the wall. Readings were taken to the nearest 0.5 cm.

The children were asked for any disease symptoms and clinical examination of all the systems was made and diagnosis of nutritional deficiency if any was made based on the findings. The data collected was analyzed using SPSS 16, by Mean SD, and Chi square tests.

**RESULTS:** A total of 630 children in the age group of 13 to 16, belonging to 4 high Schools were included in the study. 51.1% (322) of them were girls and 48.9% (308) of them were boys.

The overall prevalence of stunting was 44.6%, and it was significantly higher among boys (47.7) as compared to girls(41.6). There was a significant difference in stunting in different ages among girls, highest being in 14 years age which later decreases probably due to onset of puberty. 75% of the boys were stunted in 13 years age group which reduced as age progressed, however again the prevalence of stunting increased in 16 year old boys to 52.8%.

Around 71% of the students were underweight, with BMI <18.5. Boys (77.3%) were significantly underweight as compared to girls (64.6). The prevalence of underweight was highest in 15 yrs of age but there was no significant difference in underweight in different ages.

About 21% of the children showed signs of malnutrition and the proportion was significantly higher in girls as compared to boys. There was progressive improvement in nutritional status as the age increased. There was no significant association between clinical signs of malnutrition and stunting.

**DISCUSSION:** There is very high prevalence of underweight in the present study (71%). This is very high as compared to some of the studies 14.7% in rural West bengal[9], 54.79% among adolescent girls in rural Kolar district[10] and similar to study done in rural Tamilnadu 80%,[11]. Stunting was seen in around 32% of girls in rural Kolar[10] and 37.8% in rural west Bengal [9] which is similar to our study of 44.6%. More stunting was Noticed among among boys 38.8% as compared to girls 36.9% in a study done on South Indian adolesents[12] which is similar to our study with 47.75 and 46.6% respectively. In India, even after introducing the Mid-Day Meals scheme more than a decade ago, the number of school children who are underweight is still on the rise. Thus, the food given for Mid-Day Meals needs to be checked thoroughly to maintain its nutritional quality. Moreover, Mid-Day Meals alone cannot improve the health of students. It should be associated with Nutrition education to the parents.

**CONCLUSION:** There is a huge shortfall in growth and development of High school children which will adversely affect the nutritional status of future generations. The poor nutritional status of adolescents, especially girls, has important implications in terms of physical work capacity and adverse reproductive outcomes. School based mid day meal programme and iron supplementation should receive priority in rural areas.

| Age in Years | Boys | | Girls | |
|---|---|---|---|---|
| | Height in meters | | | |
| | mean | SD± | mean | SD |
| **13** | 4.74 | 0.40 | 4.70 | 0.35 |
| **14** | 4.75 | 0.50 | 4.72 | 0.35 |
| **15** | 4.86 | 0.49 | 5.08 | 0.38 |
| **16** | 5.00 | 0.40 | 4.80 | 0.39 |
| **Weight in Kg** | | | | |
| **13** | 37.00 | 12.94 | 33.81 | 6.35 |
| **14** | 36.41 | 8.90 | 33.72 | 6.52 |
| **15** | 39.10 | 7.17 | 38.50 | 9.69 |
| **16** | 42.10 | 7.66 | 34.92 | 7.65 |

Table 1: Average height and weight of the study population

| Age in Years | Girls | | | Boys | | | Total | |
|---|---|---|---|---|---|---|---|---|
| | Normal | Stunting | Total | Normal | Stunting | Total | Normal | Stunting |
| **13** | 7(53.8) | 6(46.2) | **13** | 4(25) | 12(75) | **16** | 11 | 18 |
| **14** | 42(36.8) | 72(63.2) | **114** | 49(45.8) | 58(54.2) | **107** | 91 | 130 |
| **15** | 66(64.7) | 36(35.3) | **102** | 66(68.8) | 30(31.2) | **96** | 132 | 66 |
| **16** | 73(78.5) | 20(21.5) | **93** | 42(47.2) | 47(52.8) | **89** | 115 | 67 |
| **Total** | 188(58.4) | 134(41.6) | **322** | 161(52.3) | 147(47.7) | **308** | 349(55.4) | 281(44.6) |
| | $X^2 = 2.38, p>0.05$ | | | | | | | |

Table II: Distribution of students according to growth in height

| Sex | Under weight | Normal | Over weight | Total |
|---|---|---|---|---|
| **Girls** | 208(64.6) | 101(31.4) | 13(4.0) | 322 |
| **Boys** | 238(77.3) | 60(19.5) | 10(3.2) | 308 |
| **Total** | **446(70.8)** | **161(25.6)** | **23(3.7)** | **630** |

Table III: Distribution of students according to BMI and sex

$X^2 = 12.54, p<0.05$

| Age in years | Under weight | Normal | Over weight | Total |
|---|---|---|---|---|
| **13-14** | 187(74.8) | 55(22.0) | 8(3.2) | 250 |
| **15** | 142(77.7) | 49(24.7) | 7(3.5) | 198 |
| **16** | 117(64.3) | 57(31.3) | 8(4.4) | 182 |
| **Total** | **446(70.8)** | **161(25.6)** | **23(3.7)** | **630** |

Table III: Distribution of students according to BMI and Age

$X^2 = 5.76, p>0.05$

| Nutritional status | Girls | Boys | Total |
|---|---|---|---|
| **Adequate** | 238(73.9) | 261(84.7) | 499(79.2) |
| **Deficient** | 84(26.1) | 47(15.3) | 131(20.8) |
| **Total** | **322** | **308** | **630** |

Table IV: Clinical nutritional status among Boys and Girls

$X^2 = 11.25$, $p<0.05$

| Nutritional status | Age in years | | | | Total |
|---|---|---|---|---|---|
| | 13 | 14 | **15** | **16** | |
| **Adequate** | 23(79.3) | 162(73.3) | 162(81.8) | 152(83.5) | 499(79.2) |
| **Deficient** | 6(20.7) | 59(26.7) | 36(18.2) | 30(16.5) | 131(20.8) |
| **Total** | **29** | **221** | **198** | **182** | **630** |

Table V: Clinical Nutritional status in various age groups

$X^2 = 7.55$, $p=0.056$

| Nutritional status | Normal | Stunting | Total |
|---|---|---|---|
| **Adequate** | 272(77.9) | 227(80.8) | 499 |
| **Deficient** | 77(22.1) | 54(19.2) | 131 |
| **Total** | **349** | **281** | **630** |

Table VI: Correlation between Clinical nutritional status and growth

$X^2 = 0.76$, $p>0.05$

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