

# Prevalence of Under-Nutrition Among Scheduled Tribe (ST) Adolescent Girls in Kodaikanal Region

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**ABSTRACT** **Background of the Study:** The global adolescent population was about 1.8 million and 90% of the adolescent community living in low and middle income countries. Adolescents defined as age group of 11-19 years as per the World Health Organization, it's a transition period of childhood to adulthood period. They are very prone to nutritional deficiencies, infections and under nutrition, due to their higher nutritional demand and social vulnerability. Adolescent's tribes are highly vulnerable to the infectious diseases and other nutritional problems like under nourishment. **Objectives:** To study the prevalence of under nutrition among Scheduled Tribe (ST) adolescent girls in Kodaikanal region. **Methodology:** Anthropometric assessment was used to identify the under nutrition among the study population. **Results and Conclusion:** The results revealed that, mean height of the respondents is 152 cm, the mean weight of the adolescent girls is 43.5 Kg and the mean body mass index is 18.8 Kg/m<sup>2</sup>. The above table reveals that the higher percent (41%) of the respondents have BMI indicated as low weight normal, followed by 31% from CED-grade I mild, 17% from CED-Grade II and 2% from CED-Grade III severe.

**Keywords:** Under nutrition, Scheduled tribes, Adolescent girls

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**Submitted:** 10-Feb-2022

**Accepted:** 12-May-2022

**Published:** 22-Jun-2022

## INTRODUCTION

The transition period with physiological, emotional and social changes arise and promotes the child into an adult period. The word adolescent was generated from Latin word *adolescencia* and maximum growth spurt happen in this period. Adolescent girls from tribal area are most vulnerable to various physical and menstrual problems. Due to the lack of knowledge on health, menstruation and poor socio economic conditions, adolescent girls from this community are suffering by malnutrition (Das *et al.*, 2017). Under nutrition and anaemia were the major health problem among adolescent girls in tribal areas (Rao *et al.*, 2003). Adolescence is a compelling period of both growth and maturation. The nutritional satisfaction of adolescent girls directly contributes to the nutritional level of the society. Thus, adolescents with

poor nutritional status enter womanhood are exposed to the risks of adverse obstetric outcomes. Inadequate healthcare facilities, illiteracy and socio-economic disadvantage among tribal populations perpetuate the vicious cycle of under nutrition. There is a need to develop comprehensive schemes for the overall development of tribal populations with special attention on adolescents.

## METHODOLOGY

In Kodaikanal, Paliyar tribal people are the earliest inhabitants, with the reference of Tamil Sangam literature, Kodaikanal

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<b>Access this article online</b>
<b>Website:</b> <a href="http://www.ijfans.org">www.ijfans.org</a>
<b>DOI:</b> 10.4103/ijfans_106-22

How to cite this article: Geethanjali Santhanam and Kavitha Maheswari. Prevalence of Under-Nutrition Among Scheduled Tribe (ST) Adolescent Girls in Kodaikanal Region. <i>Int J Food Nutr Sci</i> 2022;11:49-53.
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and Palani hills are found (Mitchell, 1972). In 1845 the Modern Kodaikanal was established by American Christian Missionaries and British people. The different types of Government schools from various places of Kodaikanal were selected, such as Perumal Malai, Thandikudi, Pambarpuram, Pannaikadu, Vilpatti, Mannavanur, and Poomparai.

The investigator approached the authorities of school in Kodaikanal tribal villages to carry out the research study on selected schools of Kodaikanal municipality in Dindigul district.

## ANTHROPOMETRICAL PROFILE

Anthropometry is a primary assessment to study the nutritional as well as the health status of an individual. It predicts the health and physical performance. Anthropometric as weight, height, mid-upper arm circumference, waist, and hip circumferences are easy to collect. This method is reliable and cost-effective to assess the nutritional status. Studying the nutritional status of adolescents will help to plan strategies for combating macro and micro deficiencies of future citizens, including future mothers. Hence, the present study focusses on the status of adolescent girls (Yattinamani et al., 2014).

The assessment of the nutritional status of an individual or community particularly in developing countries like India, anthropometry is the most powerful and practical tool. Based on this assessment Body Mass Index is the best method to assess the nutritional status (Chakraborty, 2011).

Among the various techniques of nutritional assessment, nutritional anthropometry dietary surveys are the ones most popularly used by researchers. The selection of an ideal single or combined use of anthropometric indicators depends upon the sensitivity and specificity of the symbol chosen. Standard methods assessed anthropometric assessments like weight, height, and Body Mass Index.

The following anthropometric measurements were assessed by the investigator for all the selected scheduled tribal adolescent girls from the age group of 12-19 years enrolled in the study.

### Height

Moreover, adolescent growth is linked to the onset of puberty and various genetic, hormonal and nutritional factors. The first growing and the late maturing adolescents included in a particular age group tend to level off the growth peak and camouflage the issue. Growth assessment among adolescents has come to the limelight as IAP has promised to look after them. The physical growth of adolescents especially girls has

now been identified as one of the critical determinants of the future (Elizabeth, 2001). The original height is influenced by environmental and genetic factors. The rate of height for a period of time reflects the long-term nutritional adequacy (Mahan, 2004).

### Weight

Weight is another measure that is easy to obtain. Weight also provides a crude evaluation of overall fat and muscle stores. Body weight is primarily used and most straightforward reproducible anthropometric measurement in the assessment of nutritional status. Weight assessment is a standard measure to find out the health status. A portable weighing machine with an accuracy of 0.5kg was used to record the weight, every time for accurate to zero was done every time for accurate reading. Adolescent girls were made to stand straight on a platform of the weighing machine barefooted with the school uniform clothing and weight measure up to the nearest -0.5kg.

### Body Mass Index

The Body Mass Index (BMI) is obtained from the measured weight and height of an individual. The BMI is explained as the body weight in kilograms divided by the square of the body height in meter, and is universally expressed in units of kg/m<sup>2</sup> (WHO, 2004).

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

This ratio is commonly used in evaluating malnutrition status about risk factors. The procedure followed by Srilakshmi (2006) was used to calculate the BMI using the data on weight and height of the selected respondents. Table 3.1 denotes the Body Mass Index Classification.

S. No.	Body Mass Index (BMI) Classification with Range
1	<16 (CED-Grade III severe)
2	16.0-17.0(CED-Grade II Moderate)
3	17.0-18.5(CED-Grade I Mild)
4	18.5-20.0 (Low weight normal)
5	20.0-25.0 (Normal)
6	25.0 - 30.0 (Over weight)
7	> 30.0 (Obesity)

## RESULTS AND DISCUSSION

### Anthropometrical Status of the Adolescent Girls

Anthropometrical assessment is the body measurements to assess the nutritional status of the individual. Anthropometry is a non-invasive and inexpensive practical technique of nutritional assessment especially in nutritional and epidemiological investigations. The anthropometry is a standard tool to assess health status in all age groups. In adolescents, anthropometrical assessments consider as a useful tool in growth monitoring (Khatun *et al.*, 2017). Hence anthropometric details height, weights were measured, and details are presented in the Table 1.

The above table results mean height of the respondents is 152 cm, the mean weight of the adolescent girls is 43.5 Kg and the mean body mass index is 18.8 Kg/m<sup>2</sup>. It is related to the study conducted by Maiti *et al.*, (2012) in nutritional status of tribal adolescent girls, and the results revealed that, mean BMI of girls was 15.38. 50.5% of stunting and 45.1% of thinness were observed. The study showed that this group profoundly suffered from under nutrition and growth retardation. The causes of undernourishment in the tribal community may be due to insufficient food intake, inadequate health facilities, and lower social conditions.

S. No.	Anthropometric Measurements	Mean ±SD
1	Height in (cm)	152.0444±4.26211
2	Weight (Kg)	43.5778±4.10335
3	Body Mass Index (BMI) Kg/m <sup>2</sup>	18.8201±1.27430

The below table result explains the mean values of anthropometric assessments and NCHS standards. The growth is the increase in weight and height of the selected respondents. The anthropometric values are increases due to a growth spurt and increase in age. Based on the NCHS comparison the anthropometric values such as height, weight, and BMI are lower than the standard NCHS values. It denotes that the adolescent girls were shorter and thinner than their standard values.

Mondal and Terangpi (2014) conducted a study to assess the prevalence of under nutrition among tribal adolescents of Karbi Anglong district of Assam, Northeast India. WHO recommended indices of stunting (height-for-age, <3<sup>rd</sup> percentile of National Centre of Health Statistics) and thinness (BMI-for-age, <5<sup>th</sup> percentile, National Health, and Nutrition Examination Survey) were used to assess the prevalence of under nutrition. Stunting was present in 51.2% and thinness in 13.4% among tribal adolescents of Karbi Anglong district of Assam, Northeast India.

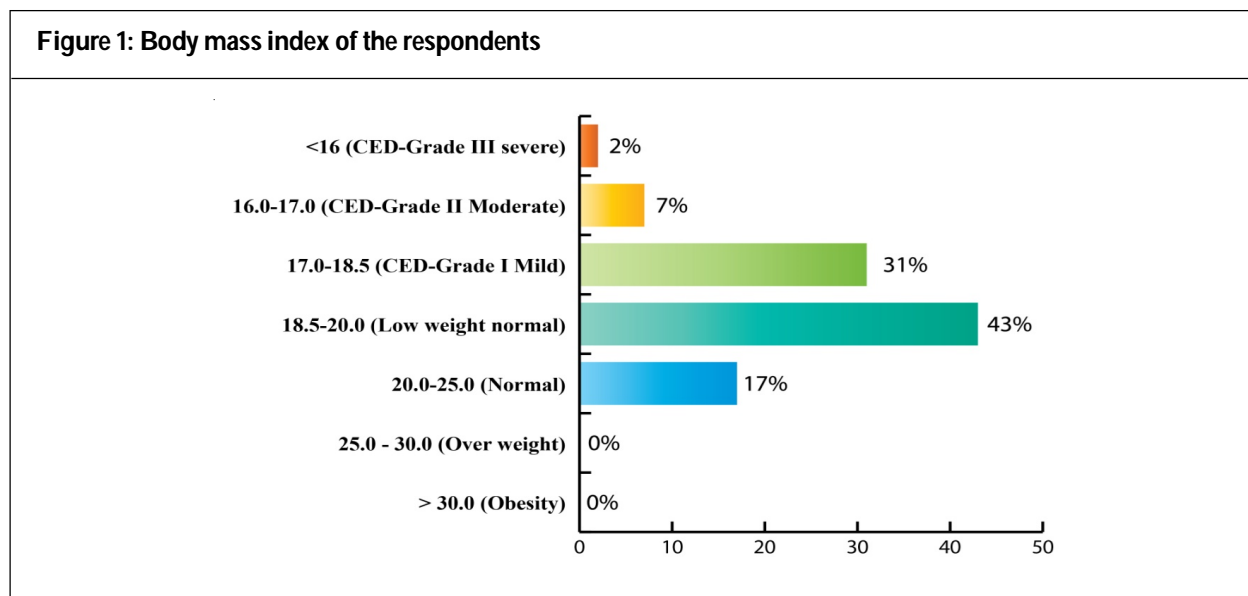
The similar findings were observed by Venkaiah (2002) which stated that a quarter of the adolescent girls had short stature and 18.6% were underweight and were considered as 'at risk.' About 39% of the adolescents stunted compared with NCHS standard.

The above table reveals that the higher percent (41%) of the respondents have BMI indicated as low weight normal, followed by 31% from CED-grade I mild, 17% from CED-Grade II and 2% from CED-Grade III severe. Only 17% of the study population belongs to the standard BMI value. None of them were found to be in overweight and obesity categories.

Deshmukh *et al.*, (2006) revealed the similar findings on the prevalence of underweight ranging from 53.8% to 68.52%. The status of chronic energy deficiency seen in the present

Age in Years	Number of Respondents	Mean Height (cm)	NCHS Height (cm)	Mean Weight (kg)	NCHS Weight (kg)	Mean BMI	NCHSBMI
12 Years	30	144.8±1.80	150.20	35.26±1.62	39.00	16.8±0.74	7.30
13 Years	35	146.5±2.50	153.80	36.85±1.51	43.40	17.1±0.63	8.30
14 Years	15	147.2±3.70	157.00	41.85±1.56	47.10	19.3±0.95	9.10
15 Years	31	152.0±2.26	158.80	44.54±2.29	49.40	19.2±0.80	19.60
16 Years	30	152.7±2.24	159.70	46.68±2.41	51.30	20.0±1.0	20.10
17 Years	37	155.3±2.04	160.20	45.43±1.75	52.80	18.8±0.91	20.60
18 Years	2	155.0±1.73	161.10	45.28±2.14	53.80	18.8±0.98	20.70

S. No.	Body Mass Index (BMI)	Number (180)	Percent (%)
1	<16 (CED-Grade III severe)	3	2
2	16.0-17.0(CED-Grade II Moderate)	12	7
3	17.0-18.5(CED-Grade I Mild)	56	31
4	18.5-20.0 (Low weight normal)	78	43
5	20.0-25.0 (Normal)	31	17
6	25.0 - 30.0 (Over weight)	0	0
7	> 30.0 (Obesity)	0	0
		<b>180</b>	<b>100</b>



study was comparable with the observations of Saravankumar et al., (2014) who studied in the age group of 10-19 years of Irular tribe adolescent girls at Thiruvalluvar District, Tamil Nadu. A cross-sectional study conducted by using a multi-stage sampling method to estimate the socio-demographic profile, anthropometrical and a biochemical estimation. The majority of them identified as anaemic and stunted.

### CONCLUSION

The above study results revealed that adolescents from tribal region are more vulnerable and highly prevalent with under nutrition. The proper dietary intervention and periodical assessment among the study group is essential to overcome the future diet oriented deficiencies and complications.

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