

# Anthropometric Assessment of Nutritional Status of Adolescent Tripuri Boys of Agartala

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## ABSTRACT

*This cross sectional study was conducted in Agartala, the capital city of Tripura. A total of 138 Tripuri boys aged 12-18 years were measured. Anthropometric measurements such as height, weight and MUAC were made following standard techniques and Body Mass Index (BMI) was computed using standard equation. Data were analyzed with statistical methods. Nutritional status was evaluated using internationally accepted BMI guidelines. The study found that 52.90% of adolescent Tripuri boys were in underweight (BMI≤18.5) status. None of the boys were found to be obese. Age and MUAC is found to be significantly positively correlated with BMI ( $r = .883$  and  $.980$  respectively at 1% level). [ $p<0.01$ ]. A vast majority of the adolescent Tripuri boys of Agartala is malnourished. Age group 12 is worst sufferer. Only 47.101% of adolescent Tripuri boys are of normal nutritional status.*

**Keywords:** Adolescent, Anthropometry, BMI, MUAC

## Introduction:

According to census 2011, Tripura has a population of 3,671,032 which constitute 0.3 per cent of India's population. Tribal population in India constitutes 8.61% of the total population where as in Tripura, Bengalee represent more than 68 percent of state's population, while the indigenous population (scheduled tribe) amounted to around 31.8 per cent. The state's scheduled tribes consist of 19 ethnic groups. The largest such group is the Kokborok - speaking Tripuris, which had a population representing 17.0 per cent of the state's population and 54.7 per cent of the scheduled tribe population.<sup>1</sup> The vast majority of the tribal populations reside in rural areas of the country.<sup>2</sup> Tripuri is one such primitive tribe resident in Tripura, India. The tribal populations of India are recognized as socially and economically underprivileged.<sup>3</sup>

Malnutrition denotes impairment of health arising either from deficiency or excess or imbalance of nutrients in the body. Adolescence is an important period in the individual's life. Adolescents represent around 20% of the global world's population and around 84% of them are found in developing countries.<sup>4</sup> Adolescents constituted 22.8% of the population in India as on 1st March 2000.<sup>5</sup>

Adolescence is an important stage of growth and development in the lifespan. This period is very crucial since these are the formative years in the life of an individual when major physical, psychological and behavioral changes take place. Adolescent may represent a window of opportunity to prepare nutritionally for a healthy adult life.<sup>6</sup> Although nutritional status can be evaluated in many ways, the BMI is most widely used because its use is inexpensive, non-invasive and suitable for large-scale surveys.<sup>7,8</sup>

Information is scanty on the anthropometric and nutritional status of various tribal populations of India and it has been recently suggested that there is urgent need to evaluate the nutritional status of various tribes of India.<sup>9</sup>

Data regarding nutritional status of adolescent Tripuri boys of Tripura is also scarce. Therefore, the present study was undertaken on a group of adolescent Tripuri tribe to assess the nutritional status based on Body Mass Index and to analyze the percentage prevalence of Chronic Energy Deficiency (CED). Thus the present study is unique which has enlightened about the nutritional status of adolescent Tripuris of Agartala, Tripura.

## Materials and methods:

**Study area-** This community based cross sectional study was conducted in Agartala, the capital city of the state Tripura, India.

**Sampling Method-** The data was collected from school going students of four different higher secondary schools of the city after taking prior permission from head of the institutions. Students were separated in different age groups starting from age group 12 to 18. Individuals from different age group were selected by simple random sampling procedure. Age of each student was confirmed from school record.

**Sample size and inclusion & exclusion criteria-** A total 138 individual were selected for collection of data. Physically challenged boys were excluded from the study.

**Variables-** Anthropometric variables such as height, weight and mid upper arm circumference (MUAC) were taken following standard techniques.<sup>10</sup> Height and MUAC were recorded to the nearest 1.0 mm and weight was recorded to nearest 0.5 kg respectively. Body Mass Index (BMI) was computed using standard equation: BMI = Weight (kg) / height (m<sup>2</sup>).

**Ethical consideration-** Ethical approval was obtained from Calcutta University Ethics Committee before commencement of the study.

**Method of analysis-** Nutritional status was evaluated using internationally accepted World Health Organization BMI guidelines.<sup>11</sup> The classification is shown in table 1. The data so collected were compiled in MS Excel and analyzed using SPSS.

**Table 1: BMI classification and ranges**

Classification	BMI Range
Underweight	<18.50
• Severe thinness	• <16
• Moderate thinness	• 16-16.99
• Mild thinness	• 17-18.49
Normal range	18.50-24.99
Over weight	≥25.00
• Pre-obese	• 25.00-29.99
Obese	≥30.00
• Obese class I	• 30.00-34.99
• Obese class II	• 35.00-39.99
• Obese class III	• ≥40.00

**Results:**

From the study it is found that 52.90% of adolescent Tripuri boys is underweight (BMI≤18.5). Severe thinness (BMI<16) is 20.29% in adolescent Tripuri boys. 100% population of age group-12, 68.75 % of age group-13 and 62.5 % of age group-14 is underweight. 77.27% population of age group-12 and 37.5% of age group-13 is of sever thinness. None were found to be obese and overweight. MUAC is found to be significantly positively correlated with BMI [r = 0.883 and 0.980 (p<0.01)].

Age, mean and standard deviation (SD) of the anthropometric variables are presented in the table bellow (Table 2). Subjects’ nutritional status (NS) based on BMI is provided in Table 3.

**Table 2 - showing age, mean and standard deviation (SD) of the anthropometric variables.**

Age in years	Number (%)	Height (cm) Mean ± SD	Weight (Kg) Mean ± SD	BMI (kg/m <sup>2</sup> ) Mean ± SD	MUAC (cm) Mean ± SD
12	22 (15.94)	163.54 ± 2.40	51.65 ± 3.84	15.17 ± 1.06	18.05 ± 1.21
13	16 (11.59)	162.57 ± 2.81	50.30 ± 3.16	17.42 ± 1.71	20.78 ± 1.78
14	16 (11.59)	161.68 ± 2.63	49.18 ± 3.18	17.88 ± 1.63	21.28 ± 1.53
15	29 (21.01)	159.72 ± 2.48	47.57 ± 3.79	18.65 ± 1.47	22.21 ± 1.22
16	20 (14.49)	157.75 ± 2.92	44.47 ± 3.95	18.82 ± 1.28	22.86 ± 1.26
17	15 (10.87)	150.52 ± 2.77	39.41 ± 3.39	19.02 ± 0.73	23.44 ± 1.00
18	20 (14.49)	138.12 ± 2.54	28.95 ± 2.39	19.31 ± 1.30	24.36 ± 1.18
Total	138	--	--	--	--

**Table 3- Distribution of Tripuri Boys According to the Various Grades of Undernutrition Based on BMI.**

BMI	Category	Percentage of sufferer
<16.0	Grade 3 thinness	20.29%
16.0 -16.99	Grade 2 thinness	11.59%
17.0 -18.49	Grade 1 thinness	21.01%
18.50 -24.99	Normal	47.10%
25.0 -29.99	Overweight	00%
>30.0	Obese	--
Total		100%

## Discussion

The problem of malnutrition received recognition of planners and policy makers right from inception of five-year planning; a large number of national nutritional programs were implemented to combat the menace of malnutrition. Still malnutrition persists. Calculation of individual BMI from weight and height, however, still remains a valid tool for epidemiological studies on assessment of nutritional status especially at the community level.<sup>12</sup>

There is a dearth of information on the anthropometric and nutritional status of the tribal population of India.<sup>13</sup> Some recent studies that have called for an urgent evaluation of the nutritional status of the tribes of India have used BMI as the measure of nutritional status.<sup>14-18</sup>

It is generally accepted that a BMI value of less than 18.5 is indicative of chronic energy deficiency (CED) across ethnic groups. In the present study, a high rate of CED among the adolescent Tripuri boys has been reported. The overall extent of undernutrition is very high in adolescent Tripuri boys of Agartala (52.90%). The present study demonstrated a significant positive correlation between MUAC and BMI.

## Conclusion and recommendation:

This study revealed that a vast majority of the adolescent Tripuri boys of Agartala are undernourished. The percentages of malnourished adolescent boys are quite alarming and steps need to be taken to improve their nutritional status. Hence it is essential to implement adolescent friendly health services to improve the nutritional status. Considering the results of this study, it is suggested that a comprehensive strategy should be implemented in disadvantaged groups of the state in order to prevent adolescent undernourishment. Efforts are needed to use the school system favorably for improving the nutritional status of boys.

In future, studies should be done on adolescent boys in urban as well as rural sectors to identify the factors responsible for this problem, which may in turn help to adopt and implement the proper strategies for upliftment of whole community.

It is also proposed that further work be undertaken among other tribal populations in India since they constitute a sizeable portion of India's population. Moreover, since undernutrition has several underlying causes, future investigations should aim at identifying the likely causes of high rates of undernutrition among Indian tribal populations.

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