Height, Weight and Body Mass Index of Children of Government High School, Balagadi, Koppa

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Abstract: Relationship between Height, weight and BMI is widely accepted parameter to measure the growth and nutritional status of an individual. Various factors like lack of knowledge, socio-economic, prenatal feeding, food habit etc. are main causes for underweight. The detailed survey type of study to measure the growth of children becomes important for administrative reason to find the real causes behind the present status in any country. 74% girls and 76% boys were observed underweight when compared with internationally accept BMI chart.

Keywords: Height, Weight, BMI, Nutrional Growth, School Children.......................

Mind, soul and body are tripod for everything[1] and a healthy mind resides within a healthy body. Even World Health Organization (WHO) defined health as, 'state of complete physical, mental and social well-being, and not merely the absence of disease or infirmity'. So, health becomes essential for growing and school going children. Various anthropometric tools are used to assess the complete health by means of dimensional description of shape and size of the body. Weight and height according to age contribute to physical measurement. Based on such measurements government policies to provide the appropriate physiological and physical growth can be framed as growth is important part of health assessment and diseases. It may also help to determine the impacts by various factors viz., genetic, environmental, socio-economical etc. on growth of children.

Government of India initiated *National Programme of Nutritional Support to Primary Education* in 1995. After the *Supreme Court* order on public interest litigation (PIL), Government of India started *Midday Meal Scheme* for all government primary schools or government assisted primary schools in 2001[2]. In Karnataka, *Children's Love Castles Trust* started the mid-day meal in 1997 only which was later replaced by the State government midday meal scheme. Government of Karnataka provides midday meal to all students of government schools up to class X[3]. Government of Karnataka also provide free books and uniforms to all schedule caste/tribe students and girl students of any caste. Karnataka is having 30 districts in 4 divisions. Chikkamagaluru is district under Mysuru division with 7 talukas in which Koppa is one[4,5].

As per 2011 census, the population of Koppa is 84,882 with 49.2% males and 50.8% females. Only 5.9% people live in urban area. The literacy rate is 83.28%. Agriculture is main source of income for people. Greater mass of population is farm workers either in their small field or as laborer. So, their aim lies to earn money to fulfill basic needs, so they avoid to send their children to schools once they are able to work in field. But after initiative from state government and some local social engineers, scenario is changing as more students are recorded. Among government schools, 12 schools are run by *Department of Education*, Government of Karnataka while 1 school is by *Tribal/social Welfare Department*, Government of Karnataka in Koppa. Government also provides aide to 6 schools of the area. Government High School, Balagadi is one of that, so it was selected for study to check the weight and height as growth of students as any detailed study to reveal the growth status is not done for specific area. Almost all the students observed in study belonged to scheduled caste/tribe or other backward classes. Many of them had

secured good places in sports at state level. Still study was needed to find the growth status.

Materials and Methods: 162 students were assessed from class VIII to class X studying in Government High School, Balagadi, Koppa. All were from lower income group. Basic information of students like name, sex and age were noted in the format and they were given with specific number. A well calibrated stadiometer was used to measure the height of students while digital electronic balance with accuracy of 0.1 kg was used to measure the weight. A comparison was done between boys and girls.

Statistical Analysis: Pearson's correlation coefficient was measured between height and weight using SPSS.

Result: The age of all students varied from 13-16 years except one boy of 17 years. The percentage of girls and boys is shown in chart number: 1. While the mean of height and weight of both girls and boys are compared with national data (Source: Nutrient Requirements and Recommended Dietary Allowances for Indians, I.C.M.R., 1990) in Table number 1 (for girls) and Table number 2 (for boys).
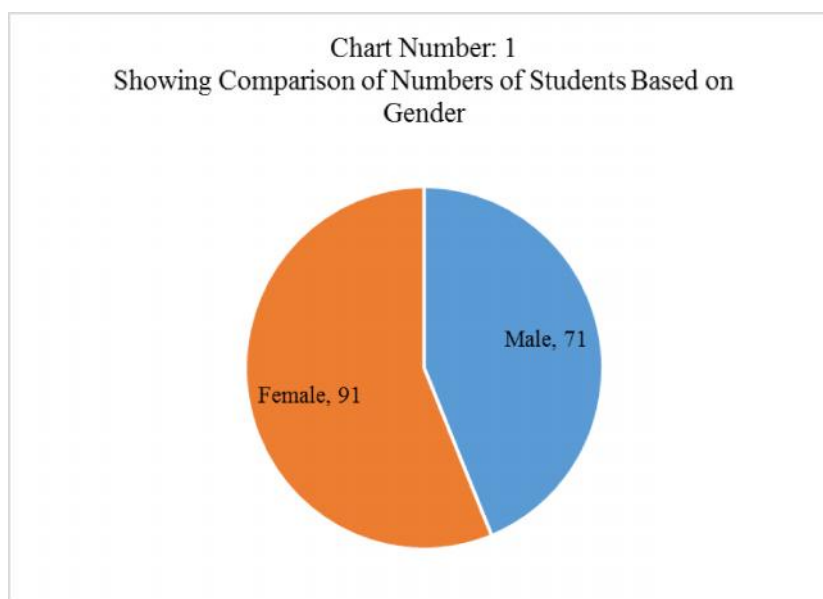

Chart Number: 1
Showing Comparison of Numbers of Students Based on Gender

Male, 71
Female, 91

Table Number: 1

Observed Means of Height and Weight of Girls of Different Age in Comparison to National Standard

Age	Height ± Standard deviation (in centimeters)	National standard	Weight ± Standard deviation (in kilograms)	National Standard
13	140.33 ± 6.58	150	32.59 ± 3.94	44
14	146.11 ± 5.87	155	37.51 ± 6.57	48
15	149.83 ± 6.32	161	39.48 ± 6.62	51.5
16	150.67 ± 4.30	162	40.28 ± 7.63	53

Table Number: 2

Observed Means of Height and Weight of Boys of Different Age in Comparison to National Standard

Age	Height ± Standard deviation (in centimeters)	National standard	Weight ± Standard deviation (in kilograms)	National Standard
13	140.50 ± 6.01	153	30.68 ± 5.52	40.9
14	147.12 ± 7.26	160	36.08 ± 6.68	47
15	153.38 ± 9.01	166	40.41 ± 7.75	52.6
16	160.67 ± 8.86	171	49.29 ± 8.04	58
17	170.00 ± 0.00	175	52.00 ± 0.00	62.7

Chart Number: 2

Frequency of Boys and Girls of Different Age
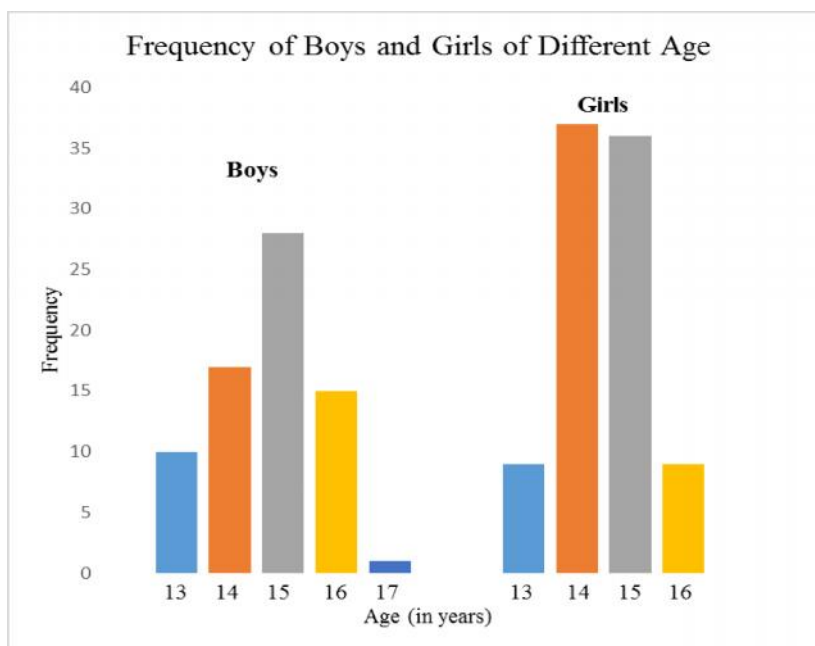
Chart Number: 3
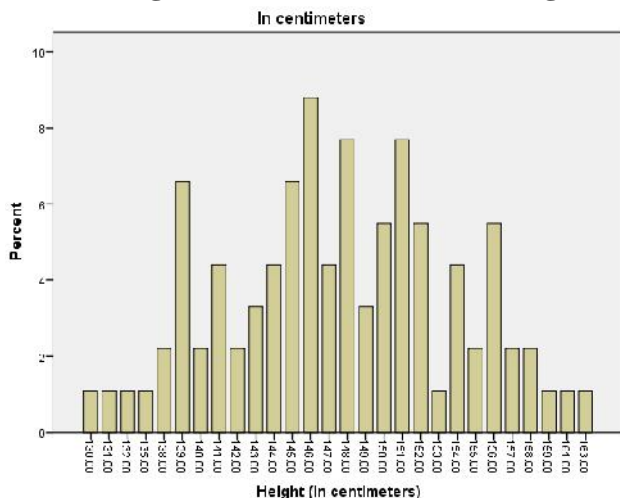
Percenatge of Girls With Different Height

Chart Number: 4

Percenatge of Boys With Different Height
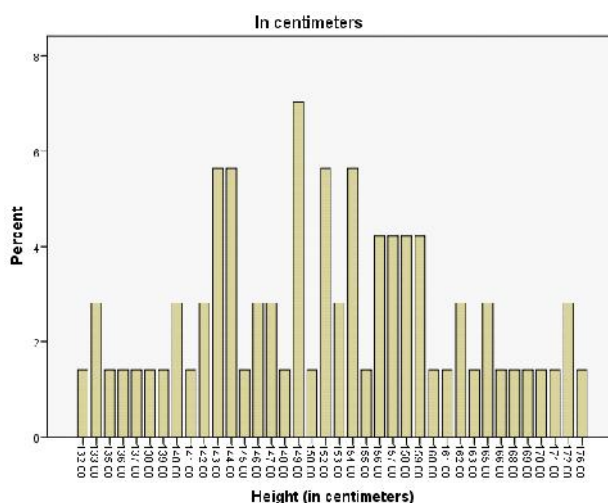

Chart Number: 5
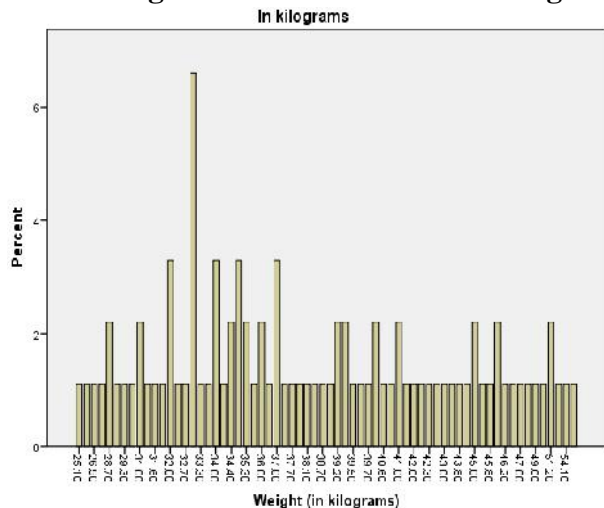
Percenatge of Girls With Different Weight
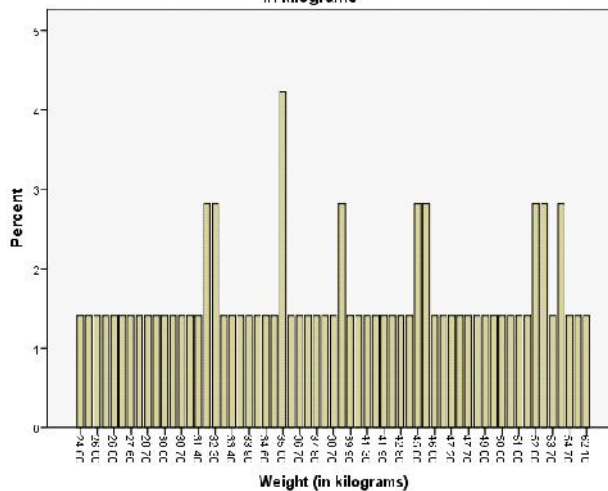

Chart Number: 6

Percenatge of Girls With Different Weight

Table Number: 3

Showing Correlation Between Height and Weight in Girls and Boys

Pearson's Coefficient of Correlation

Girls	0.743
Boys	0.826

Table Number: 4

Mean and Standard Deviation of Body Mass Index (kg/m^2) of Girls and Boys

Mean $\pm$ Standard Deviation

Girls	17.51 ± 2.40
Boys	17.13 ± 2.48

Chart Number: 7	**Chart Number: 8**
Percentage of Girl in Normal Weight and Underweight Category	**Percentage of Boys in Normal Weight and Underweight Category**

Chart Number: 7 — Girls (Normal weight) 26%, Girls (Under weight) 74%

Chart Number: 8 — Boys (Normal weight) 24%, Boys (Under weight) 76%
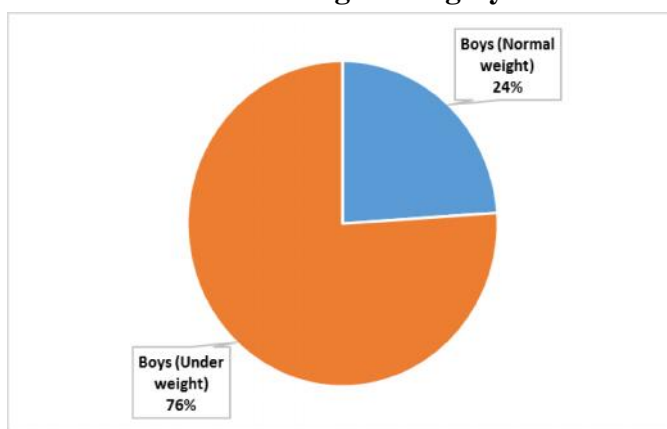
Discussion: A moderate correlation was observed between height and weight of both girls and boys. 74% girls and 76% boys were recorded underweight when compared with BMI chart[8]. Other than genetic factors, the association of underweight may be related to parents' education, prenatal nutritional status, complementary feeding practices, family income[9,10] etc. as people from lower income groups and having less information emphasizes more on satisfying the hunger than the nutritious food. Food-habit also plays an important role for underweight as some students . . . . *Sambhar-rice* than other food items provided by government. Almost similar patterns were noted in both girls and boys, still girls were slightly better than boys as boys are habitually more involved in game and other physical works. A detailed study including the nutritional status of food provided by government, weight-variation monitoring etc. may have still chances to improve the condition.

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