

# Nutritional Status of School Going Children (7-9 years) of Rohtak District, Haryana

## Abstract

Under-nutrition continues to be a primary cause of ill health and mortality among children in developing countries. Besides poverty, there are other factors that directly or indirectly affect the nutritional status of children. The present study was conducted in Rohtak district, Haryana to assess the nutritional status of 7-9 years school going children. A total of 200 school going children were selected randomly from four different schools in the study area and the nutritional status was assessed by anthropometric measurements. Among 200 students, 29% of the students were found to be moderately underweight, 7.5% were severely underweight, 24 and 10 per cent were moderately and severely stunted, 16 and 7% were moderately and severely wasted, respectively.

**Keywords:** Anthropometry, Malnutrition, School children

## Introduction

Nearly one-sixth of people in our world are affected by chronic hunger. At anytime, around a quarter of all children suffer from under nutrition. Not only are they more likely to die, but also they do less than those who were well nourished (1). Malnutrition continues to be a primary cause of ill health and mortality among children in developing countries. It is a major public health problem and accounts for about half of all child deaths worldwide. About 150 million children in developing countries are still malnourished and more than half of underweight children live in South East Asia Region(2). The best global indicator of children's well being is growth. Poor growth is attributable to a range of factors closely linked to overall standards of living and the ability of populations to meet their basic needs, such as access to food, housing and health care. Assessment of growth is the single measurement that best defines the nutritional and health status of children, and provides an indirect measurement of the quality of life of the entire population.

Nutrition plays a vital role as inadequate nutrition during childhood may lead to malnutrition. In the present study, an attempt was made to find the prevalence of malnutrition among school children of 7-9 years age group in Rohtak district of Haryana.

## Materials and Methods

The present study was conducted on school going children in the age group of 7-9 years. Total 200 rural school going children i.e. 100 boys and 100 girls were selected proportionately for the study from the Govt. Primary School of Lakhanmajra and Kahanaur villages of Rohtak district, Haryana.

Nutritional status of all the selected children was assessed by measuring body height (cm), weight (kg) which was compared with the NCHS (National Centre for Health Statistics ) Standards and the standards given by ICMR (Indian Council of Medical Research) (2010). Height of children was measured by a vertical measuring rod calibrated in centimeters placed on plain floor. Weighing balance calibrated in kilogram and gram was used to taking weight of respondents.

Malnutrition was calculated as normal, mild, moderate and severe according to Gomez Classification (4), of weight for age, Waterlow classification (5) for height for age.

## Results and Discussion

The mean height and weight of both groups i.e. 7-8 and 8-9 years were significantly lower than the ICMR standard value. Sati and Dahiya (2012) also reported similar range of height, weight and triceps in



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school children of Hisar district, Haryana. They pointed out that all girls and boys were lower in height and weight when compared to standard ICMR and NCHS values.

**Table 1: Mean anthropometric measurements of school going children (7-8 years)**

Anthropometric Parameter	Boys (n = 44)				Girls (n = 42)			
	Reference value	Observed value	Z-value	% Reference value	Reference value	Observed value	Z-value	% Reference value
Height (cm) <sup>(a)</sup>	124.3	106.42±11.20	-10.64*	85.61	123.6	104.68±10.69	-11.53*	84.69
Weight (kg) <sup>(a)</sup>	22.7	18.54±2.63	-10.66*	81.67	22.3	17.78±2.38	-12.55*	79.73
Body mass index (kg/m <sup>2</sup> ) <sup>(a)</sup>	14.7	12.37±1.19	-13.70*	84.14	14.6	11.88±1.04	-17.00*	81.36
Triceps skin fold thickness(mm) <sup>(b)</sup>	15.0	6.76±2.25	-24.96*	45.06	16.0	5.99±1.96	-33.36*	37.43

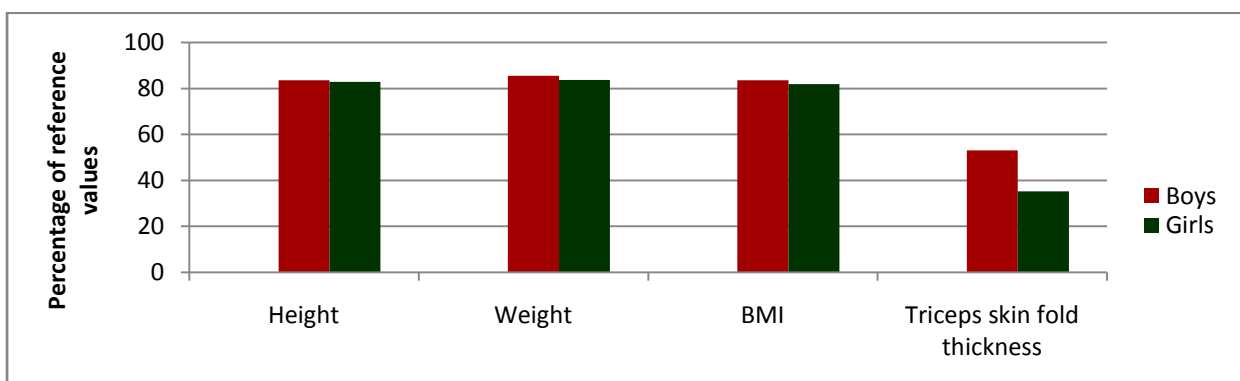
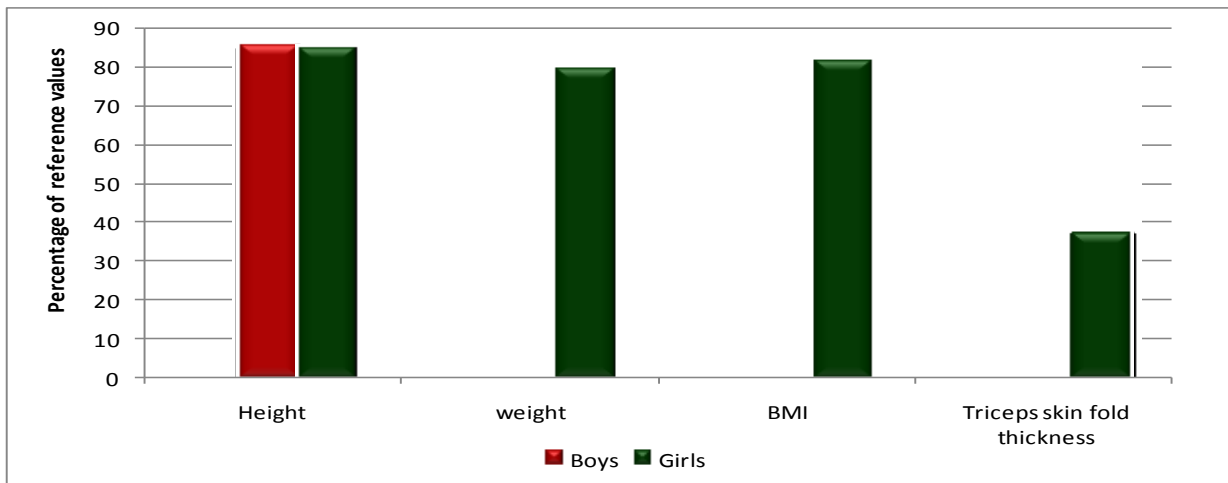
Values are Mean ± SD

\*Significant at 5% level

Z-value indicates comparison of observed and reference values

Reference values are according to ICMR (2010)<sup>(a)</sup>, Gnanasundaram *et al.*(1994)<sup>(b)</sup>

**Fig. 1: Mean anthropometric measurements of school going children (7-8 years)**



**Fig. 2: Mean anthropometric measurements of school going children (8-9 years)**

**Table 2: Mean anthropometric measurements of school going children (8-9 years)**

Anthropometric Parameter	Boys (n = 56)				Girls (n = 58)			
	Reference value	Observed value	Z-value	% Reference value	Reference value	Observed value	Z-value	% Reference value
Height (cm) <sup>(a)</sup>	130.1	108.69±13.84	-11.57*	83.54	129.2	107.14±12.53	-13.45*	82.92
Weight (kg) <sup>(a)</sup>	25.2	21.56±3.09	-8.87*	85.55	25.0	20.94±3.47	-9.02*	83.76
Body mass index (kg/m <sup>2</sup> ) <sup>(a)</sup>	14.9	12.46±1.27	-15.25*	83.62	15.0	12.29±1.34	-15.94*	81.93
Triceps skin fold thickness (mm) <sup>(b)</sup>	13.0	6.89±2.14	-21.82*	53.00	18.0	6.34±2.09	-43.18*	35.22

Values are Mean ± SD

\*Significant at 5% level

Z-value indicates comparison of observed and reference values.

Reference values are according to ICMR (2010)<sup>(a)</sup>, Gnanasundaram *et al.*(1994)<sup>(b)</sup>

#### Prevalence of malnutrition

Regarding prevalence of malnutrition, according to WHO classification total 36.5 per cent, 34 per cent and 23 per cent were underweight, stunted and wasted, respectively. Rana *et al.* (2013) also detected stunting (27.5%), underweight (32.5%) and wasting (17%) among school going children of Hisar district, Haryana.

**Table 3: Prevalence of underweight, stunting and wasting among school going children (7-9 years)**

WHO classification	Sex		Total (n=200)
	Boys (n=100)	Girls (n=100)	
Weight for age <-2SD Moderately underweight	25	33	58 (29)
Weight for age <-3SD Severely underweight	6	9	15 (7.5)
Height for age <-2SD Moderately stunted	20	28	48 (24)
Height for age <-3SD Severely stunted	8	12	20 (10)
Weight for height <-2SD Moderately wasted	10	22	32 (16)
Weight for height <-3SD Severely wasted	5	9	14 (7)

WHO 1995<sup>a</sup>

Values in parentheses indicate percentage

Weight for height is an index of current nutritional status of children and those with low WHZ are considered as wasted. Sixteen per cent children were moderately wasted and 7 per cent were severely wasted and rest were normal.

**Table 4: Per cent distribution of school going children (7-9 years) according to their body weight (Gomez Classification)**

% weight for NCHS Standard	No. of Respondents	
	Boys (n=100)	Girls (n=100)
>90	34(34.0)	37(37.0)
75-90	57(57.0)	49(49.0)
60-75	9(9.0)	14(14.0)
<60	-	-

Gomez (1955)

Values in parentheses indicate percentage

NCHS Standards (2008)

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The data presented in Table 4 shows that 34 per cent of boys and 37 per cent of girls were found normal by weight. Fifty seven per cent of boys and 49 per cent of girls were found to be mildly malnourished and 9 per cent of the boys and 14 per cent of the girls were found to be moderately malnourished according to Gomez's classification

Anthropometric measurements showed that mean height, weight, BMI and Skin fold thickness at triceps were significantly ( $P < 0.05$ ) lower than the reference value in both boys and girls and significant difference was found on comparing the anthropometric measurement of boys and girls. Regarding prevalence of malnutrition 29% of the students were found to be moderately underweight, 7.5% were severely underweight, 24 and 10 per cent were moderately and severely stunted, 16 and 7% were moderately and severely wasted according to WHO(1995a) classification.

## Conclusion

Malnutrition among children is a major public health problem. Besides poverty, there are other factors that directly or indirectly affect the nutritional status of children. The present study highlights the prevalence of malnutrition among school going children in Rohtak and the prevalence can be reduced by increasing awareness

in mothers regarding the nutritional intake of child. Also, there is a great need to focus the attention of policy-makers on the nutritional status of children as it is one of the main indicators of development.

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