

ASSESSMENT OF THE NUTRITIONAL STATUS OF CHILDREN

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ABSTRACT

A study was conducted to assess the nutritional status of school going children (10-13 years) of Yamunanagar and Jagadhri district of Haryana. The anthropometric measurements revealed that the height of boys and girls (10-12 years and boys 13 years) of both the districts did not differ significantly ($P < 0.05$) among themselves whereas the girls of 13 years of Yamunanagar district had significantly ($p < 0.05$) more height than those belonging to Jagadhri district. However, the boys and girls of both the age groups in both the districts had significantly ($p < 0.05$) less body weight as compared to NCHS values. The body mass index values of pre adolescents of both the age groups were also below the normal values in both the districts. The children of both the age groups from both the districts had significantly ($p < 0.05$) less haemoglobin levels than the standard values. Sub-optimum nutritional status of the children was due to fewer intakes of energy, protein and iron rich foods in both the districts.

INTRODUCTION

Children play an important role in the development of nation as they are the future of any country. The development potential of society depends upon the level of physical and mental state of its young population for which childhood lays the foundation and nutrition is an important determinant of the quality and strength of this foundation. Growth and development depend on nutrition to support physiological and metabolic process of the body and the consequently the nutritional status of school going children is profoundly influenced by the diet consumed by them (Rao et al., 1984).

Malnutrition during critical period of growth leads not only to the stunting of physical growth but also to suboptimal intellectual development. Nutritional deficiencies may not necessarily be due to the deficiency of more than one nutrient in the diet taken currently for considerable period of time. The deficiency of one or more nutrients may produce different diseases in accordance with varying degrees of deficiencies of nutrients, human resistance and variable climatic conditions. Hence, diet and nutrition surveys conducted from time to time on various section of the population prove very useful to the policy time to time on various section of the population prove very useful to the policy makers so as to formulate policies and programmes to curb malnutrition in time. Keeping it in view, a survey of school going children residing in Yamunanagar and jagadhri districts of Haryana was conducted to assess their nutritional status.

MATERIAL AND METHODS

Selection of area : Panchkula and Hisar districts of Haryana were selected purposively to carry out the present investigation.

Assessment of nutritional status: For anthropometric measurements data regarding height, weight and mid-arm circumference (Jellife, 1966) of the selected children were collected. Mean height and weight values were compared with standards of NCHS (1987) and the values for mid-arm circumference were compared with standards of Vijayaraghavan et al. (1974).

The body mass index was calculated using the equation given by Garrow (1981)

$$\text{BMI (kg)} = \frac{\text{Weight (kg)}}{\text{Height (m}^2\text{)}}$$

The Haemoglobin level of subjects was estimated by using Sahil type of clinical haemoglobinometer (Oser, 1954). Value were compared with the standards of WHO (1989). The data were subjected to statistical analysis using standards methods (Snedecor and Cochran, 1980).

RESULTS AND DISCUSSION

Anthropometric Measurements

Height : The mean height of boys (10 to 12 years) was 129.7 and 130.1 cm and of girls 129.8 and 131.8 cm in Jagadhri and Yamunanagar districts, respectively (Table 1). Height of both the genders in both the districts was significantly ($p < 0.05$) less when compared to the standard values of NCHS (1987). However, the height of girls as well as boys (10 to 12 years) belonging to both the districts did not differ significantly ($p < 0.05$) among themselves.

Mean height of boys (13 years) was 139.6 and 143.5 cm and of girls (13 years) was 128.3 and 135.2 cm in Jagadhri and Yamunanagar districts, respectively. The girls of 13 years belonging to Yamunanagar district had significantly ($p < 0.05$) more height than those belonging to Jagadhri district whereas such differences were not noticed among the boys. The boys as well as girls of this age group in both the districts had significantly ($p < 0.05$) less weight than the standard (NCHS 1987) values. Similar finding among the school children have been noticed earlier too (Verma and Bajaj, 1985; Chandana, 1993).

Weight : Boys and Girls (10 to 12 years) belong to Jagadhri district had 23.4 and 22.1 kg body weight, respectively, whereas those belonging to Yamunanagar district had 29.9 and 24.7 kg, respectively (Table 1). On the whole significant ($p < 0.05$) differences in weight were not observed among the children of these two districts.

In the age group of 13 years, there were not significant variation among the weights of boys belonging to Yamunanagar and Hissar districts but girls of Yamunanagar district had significantly ($p < 0.05$) more weight than those belonging to Jagadhri district. However, boys and girls of both the age groups and belonging to both the districts had significantly ($p < 0.05$) less body weight when compared to those of standards NCHS values. Less body weight may be due to less intake of various food groups. The diets of the respondents of both the districts were deficient in energy, protein and iron which is due to their low intake of cereals, and Milkhaïlov (1997) reported that the daily intakes of protein, fat and carbohydrates were below normal requirement in school children of Murmansk region, Russia. About 3 per cent of school children suffered from chronic undernutrition (Tena-flores and Frisanche, 1997). In different studies conducted in India, previous workers (Pai and Naik 1989, Chandanad, 1993; Bhatia, 1996) also reported lower body weight and height among

the school going children than the reference values. On the contrary, higher body weight and height have been reported by some other researchers (Bhasin et al., 1990; Yaima and Narendra 1992).

Table - 1

Anthropometric measurements of school going children of Jagadhri and Yamunanagar districts of Haryana

Anthropometric Measurements	Age group	Standard	Jagadhri	Yamunanagar	't ₁ ' value	't ₂ ' value	't ₃ ' value
Height (cm)	10-12						
	Boys	141.5 ^a	129.79±2.54	130.15±2.54	5.80**	4.45**	0.11
	Girls	142.76 ^a	129.88±2.49	131.87±0.94	5.16**	11.51**	0.65
	13						
	Boys	153.0 ^a	139.68±2.78	143.54±2.50	4.78**	3.77**	1.00
	Girls	155.0 ^a	128.33±1.25	135.20±1.69	21.33**	11.65**	3.06*
Weight (kg)	10-12						
	Boys	33.53 ^b	23.41±1.04	25.93±1.12	9.71**	6.75**	1.60
	Girls	34.963 ^b	22.13±0.87	24.75±0.95	14.58**	10.64**	1.98
	13						
	Boys	40.90 ^b	28.75±2.36	26.75±0.73	5.13**	19.19**	0.94
	Girls	44.00 ^b	28.22±1.39	34.58±0.46	11.27**	20.11**	4.82**
MAC (cm)	10-12						
	Boys	19.28 ^c	16.82±0.33	16.71±0.32	7.24**	7.78**	0.21
	Girls	19.53 ^c	15.20±0.25	15.44±0.84	14.23**	11.77**	0.89
	13						
	Boys	20.29 ^c	17.34±0.55	18.74±0.45	5.34**	3.38**	1.96
	Girls	21.04 ^c	14.79±0.77	15.11±0.11	8.01**	21.58**	0.47

Values are mean \pm SE

't₁' Values indicate the comparison of anthropometric measurements of respondents of Jagadhri district with standard value.

't₂' Values indicate the comparison of anthropometric measurements of respondents of Yamunanagar district with standard value.

't₃' Values indicate the comparison of anthropometric measurements of respondents of Jagadhri and Yamunanagar district with standard value.

* Significant at 5% level.

** Significant at 1% level

a NCHS (1987)

b NCHS (1987)

c Vijayaraghavan et al. (1974)

Table-2

Body Mass Index (BMI) kg/m² of school going children (10-13 years) of Jagadhri and Yamunanagar districts of Haryana

Respondents	Age group (years)	Jagadhri	Yamunanagar	CD (P<0.05)
Boys	10-12	13.82 \pm 0.81	15.35 \pm 0.81	NS
	13	14.58 \pm 0.81	18.23 \pm 0.81	NS
Girls	10-12	13.13 \pm 0.85	14.50 \pm 0.85	2.33
	13	17.25 \pm 0.85	19.25 \pm 0.85	NS

Mid arm circumference : Mid arm circumference of boys as well as girls of both the age groups was significantly ($p < 0.05$) less than the standard values in Jagadhri as well as Yamunanagar districts. The perusal of data reveals that there were no significant variations in the mid arm circumference of these children belonging to both the districts. Poor nourishment of children may be contributing towards the low values of MAC than the standard values. These findings are in agreement with other workers (Lakhmi and Rao, 1988, Chandana, 1993 and Goyal, 1994).

Table - 3

Haemoglobin level (g/100 ml blood) of school going children of Jagadhri and Yamunanagar districts of Haryana

Age (Years)	Respondent	Standard Hb level	Hb Level		't ₁ ' value	't ₂ ' value	't ₃ ' value
			Jagadhri	Yamunana gar			
10-12	Boys	12 ^a	11.31±0.24	9.26±0.80	2.82*	3.41*	2.88*
	Girls	12 ^a	10.29±0.21	9.17±0.20	8.22**	14.07**	3.74*
13	Boys	12 ^a	10.77±0.61	10.57±0.21	2.13*	6.72**	0.35
	Girls	12 ^a	10.14±0.16	9.88±0.31	11.18**	6.74**	0.66

Values are mean ± SE

't₁' Values indicate the comparison of Hb level of respondents of Jagadhri district with standard value.

't₂' Values indicate the comparison of Hb level of respondents of Yamunanagarr district with standard value.

't₃' Values indicate the comparison of Hb level of respondents of both the districts with standard value.

* Significant at 5% level.

** Significant at 5% level

a WHO (1989)

Body mass index : The mean BMI values for boys in the age group of 10 to 12 years and 13 years were 13.8 and 14.5 in Jagadhri and 15.3 and 13.2 in Yamunanagar district, respectively (Table 2). The BMI values of boys and girls belonging to these two age groups in both the districts did not differ significantly ($p < 0.05$). The observed BMI values among boys as well as girls were below the normal BMI values i.e. 20 to 25, above which obesity starts (Garrow, 19810. Similar findings are reported earlier (Sood, 1992, Bhatia, 1996 and Thumbi, 1993).

Haemoglobin : In the age groups of 10 to 12 years, the levels of haemoglobin values of boys as well as girls were significantly ($p < 0.05$) less than the standard values in both the districts. Boys as well girls belonging to Yamunanagar district had significantly ($p < 0.05$) less haemoglobin level than those belonging to Jagadhri district which is due to less intake of iron rich foods especially green leafy vegetables and fruits (Table 3).

Boys and girls of 13 years in both the districts had significantly ($p < 0.05$) less haemoglobin level than the standard values. However, haemoglobin levels of boys as girls belonging to Jagadhri

district did not differ significantly from those of children belonging to Yamunanagar district. The lower levels of haemoglobin of boys as well girls belonging to both districts may be due to fewer intakes of iron rich foods. The results of present investigation are in accordance with those of earlier workers (Chandana, 1993; Goyal, 1994).

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