

## Health profile of adolescent boys of Sagar City, Madhya Pradesh, India

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**ABSTRACT:** The present paper is an attempt to assess the health profile of purposively selected 200 adolescent boys of Sagar city, Madhya Pradesh. The height and weight of the boys were compared with the standards given by Indian Council of Medical Research, National Centre for Health Statistics and Indian Council of Agricultural Research; body mass index (BMI) and its association with occupation of father and education of parents was assessed. The height and weight of the boys were found below Indian Council of Medical Research and National Centre for Health Statistics standards but above the Indian Council of Agricultural Research standards. Most of the underweight boys belonged to fathers having business as their occupation whereas most of the normal boys belonged to fathers who were government employees. On the basis of education of parents, it was found that fathers who studied up to higher secondary classes have most underweight boys and most normal boys belonged to graduate fathers; whereas highly underweight boys belonged to mothers who studied up to secondary classes and mothers who studied up to higher secondary classes showed the highest number of normal boys.

**KEYWORDS:** Adolescent boys, body mass index (BMI), health profile, socio-economic status.

### INTRODUCTION

Nutrition plays a vital role in life of any individual. Inadequate nutrition during childhood may lead to malnutrition, growth retardation, reduced work capacity and poor mental as well as social development (Awasthi and Kumar, 1999). Children and adolescents being the future citizens form an important segment of Indian population. Their good nutrition is an indispensable component of healthy life (Sankhala et al., 2004). Adolescent health has recently drawn greater attention in India and the nutritional status during adolescent age is an important determinant of health outcome (Mohan et al., 2013). Joshi et al. (2014) in their paper have described adolescents as the best human resources. Malnutrition especially under-nutrition is a major health problem affecting the development of children in many low and middle income countries. The government of India has adopted a number of schemes to address the problems among children up to five years of age. Although fewer studies have been focused on under-nutrition among adolescents or programmes tackling adolescent nutrition. Studies in different parts of the country have also indicated that balance diet is not available to the major population in general and to school going children in particular which leads to their improper health (Mishra & Singh, 2006).

For the diagnosis of malnutrition, anthropometry is an excellent tool of diagnosis, validated by experimental studies. Anthropometry offers a reliable method to assess the nutritional status of children (Bhasin et al., 1990; Bisai et al., 2008). It has been now well established that body mass index (BMI) is also one of the most appropriate, inexpensive and non-invasive tool to use to determine the nutritional status (Bose & Bisai, 2008).

Adolescents are the core of any population as adolescence is a transition stage in life cycle of any individual whether it belongs to either sex. Many studies such as, by Awasthi & Kumar (1999), Bisai et al. (2008), Busi et al. (2003), Chakma et al. (2009), Dasgupta et al. (2010), Gaur et al. (2002), Joshi et al., (2014), Khadi et al., (2004), Kshatriya et al. (1981), Maiti et al., (2011), Rao et al. (2005), Tiwari et al. (2007), Vashisht et al. (2005), etc. have been conducted to study the growth and nutritional status among adolescent boys and girls. But there occurs a very meagre accountability of research work focusing the association of nutrition and socio-economic parameters among adolescents. The present study is an attempt to assess the nutritional profile of school going adolescent boys of Sagar city, Madhya Pradesh and association of body mass index (BMI) is assessed with occupation of father and education of parents. The present study has been conducted with the following objectives:

- To assess the health profile by comparing the height and weight of boys with the standards given by Indian Council of Medical Research (ICMR), National Centre for Health Statistics (NCHS) and Indian Council of Agricultural Research (ICAR);
- To find out the association between health profile and socio-economic status.

## MATERIAL AND METHODS

The present study has been conducted on 200 adolescent boys of age 13 to 18 years studying in Jain Public School of Sagar city, Madhya Pradesh. The subjects were selected purposively and due care was given to the respective ages. The study includes assessment of body mass index (BMI) with the help of height & body weight. Education of the parents and occupation of father were also noted as education is an indirect means to assess the economic standard of the family. The occupation is divided into following categories viz.; labours, skilled labours, businessmen, farmers/agriculturalists, government employees, private employees and others (journalists, engineers, etc.). Body mass index (BMI) has been classified on the basis of classification given by World Health Organisation (WHO). The height and weight of the boys has been compared with the ICMR, NCHS and ICAR standards.

## RESULTS & DISCUSSIONS

The mean height and weight of the boys are presented in table no. 1 & 2 respectively. It is observed that the height of the boys increases with age except for 18 years whereas weight of the boys increases with age except for 17 years of age, but again increases at 18 years. There was not much difference between the height and weight of 17 and 18 year and 16 and 17 year old boys respectively. The height and weight of the boys were found below ICMR and NCHS standards but above the ICAR standards. The mean values of height and weight were found to be more than those reported by Khadi *et al.* (2004). The study by Khadi *et al.* (2004) was conducted among 4593 rural boys and girls drawn from agro climatic zones of northern Karnataka aged 6-18/20 years. The obtained weights and heights were compared with ICMR, NCHS and ICAR standards.

Table 3 displays distribution of body mass index among boys on the basis of their age. It was found that the highest percentage of underweight boys belonged to 15 years of age (90.9%) whereas least percentage of underweight boys were of 18 years of age. The boys who were 17 years of age showed the highest percentage of normal body mass index whereas least percentage (9.1%) of boys were from 15 years of age. Highest percentage of boys who were found obese belonged to 16 years of age.

**Table No. 1- Comparison of mean height of boys with ICMR, NCHS and ICAS standards:**

AGE	MEAN	S.D.	ICMR	NCHS	ICAR
13	145.66	7.40	154.94	156.50	141.20
14	152.90	7.71	161.70	163.10	148.00
15	159.53	8.78	165.33	169.00	153.00
16	163.58	6.93	168.40	173.50	159.00
17	166.30	7.09	173.00	176.20	161.35
18	166.25	6.09	172.05	176.80	163.00

\*Indian Council of Medical Research

\*\*National Centre for Health Statistics

\*\*\*Indian Council of Agricultural Research (cited)

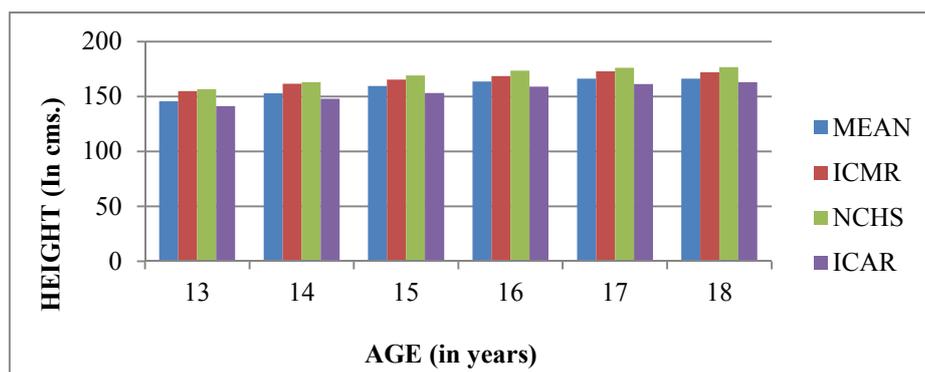


Table No. 2- Comparison of mean weight of boys with ICMR, NCHS and ICAS standards:

AGE	MEAN	S.D.	ICMR*	NCHS**	ICAR***
13	34.80	6.08	42.88	45.0	29.00
14	39.14	8.84	48.26	50.8	29.00
15	43.22	8.44	52.15	56.7	33.00
16	48.23	9.94	55.54	62.1	37.00
17	48.22	7.74	57.91	66.3	43.00
18	51.37	7.06	58.38	68.9	47.00

\*Indian Council of Medical Research

\*\*National Centre for Health Statistics

\*\*\*Indian Council of Agricultural Research (cited)

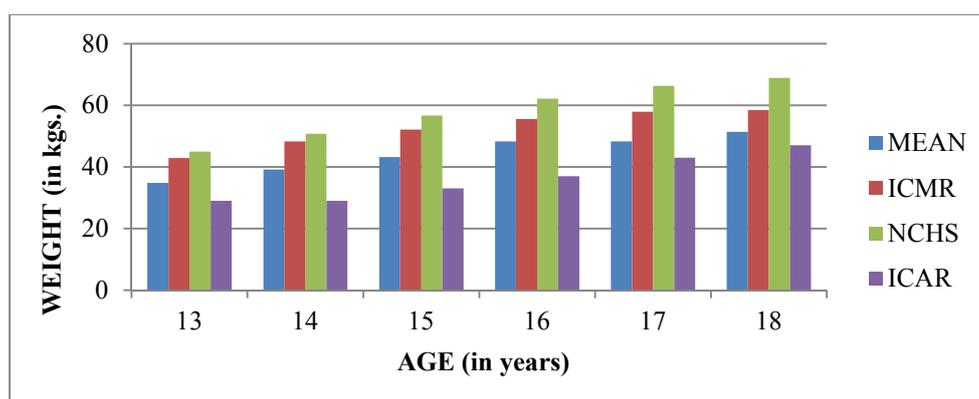


Table No. 3: Distribution of Body Mass Index (BMI) on the basis of age:

S.No	BODY MASS INDEX (BMI)		AGE (IN YEARS)						TOTAL
	VALUE	CLASSIFICATION	13	14	15	16	17	18	
1.	<18.5	Underweight	27 (18%)	34 (22.67%)	30 (20%)	23 (15.33%)	19 (12.67%)	17 (11.33%)	150 (100%)
2.	18.5-24.9	Normal	3 (6.52%)	6 (13.04%)	3 (6.52%)	10 (21.74%)	8 (17.39%)	16 (34.79%)	46 (100%)
3.	25.0-29.9	Overweight	1 (25%)	-	-	2 (50%)	-	1 (25%)	4 (100%)
4.	30.0-34.9	Obesity/ Class I	-	-	-	-	-	-	-
5.	35.0-39.9	Obesity/ Class II	-	-	-	-	-	-	-
6.	>40	Obesity/ Class III	-	-	-	-	-	-	-
TOTAL			31	40	33	35	27	34	200

**Table No. 4: Distribution of Body Mass Index (BMI) on the basis of occupation of father:**

S.No	OCCUPATION	STATUS OF BODY MASS INDEX (BMI)						TOTAL
		Under weight BMI <18.5	Normal BMI = 18.5-24.9	Over weight BMI = 25.0-29.9	Obesity/ Grade I BMI = 30.0-34.9	Obesity/G rade II BMI = 35.0-39.9	Obesity/ Grade III BMI >40	
1.	LABOUR	25 (80.65%)	4 (12.90%)	2 (6.45%)	-	-	-	31 (100%)
2.	SKILLED LABOUR	20 (86.96%)	3 (13.04%)	-	-	-	-	23 (100%)
3.	BUSINESS	39 (78%)	11 (22%)	-	-	-	-	50 (100%)
4.	FARMING/ AGRICULTURE	26 (76.47%)	8 (23.53%)	-	-	-	-	34 (100%)
5.	EMPLOYEES: Government-	33 (71.74%)	13 (28.26%)	-	-	-	-	46 (100%)
	Private-	7 (70%)	2 (20%)	1 (10%)	-	-	-	10 (100%)
6.	OTHERS	6 (75%)	1 (12.5%)	1 (12.5%)	-	-	-	8 (100%)
TOTAL		150	46	4	-	-	-	200

**Table No. 5: Body Mass Index on the basis of education of father:**

S.No.	EDUCATION	STATUS OF BODY MASS INDEX (BMI)						TOTAL
		Under weight BMI <18.5	Normal BMI = 18.5-24.9	Over weight BMI = 25.0-29.9	Obesity/ Grade I BMI = 30.0-34.9	Obesity/ Grade II BMI = 35.0-39.9	Obesity/ Grade III BMI >40	
1.	Illiterate	4 (100%)	-	-	-	-	-	4 (100%)
2.	Primary	11 (84.62%)	2 (15.38%)	-	-	-	-	13 (100%)
3.	Middle	20 (83.33%)	3 (12.5%)	1 (4.17%)	-	-	-	24 (100%)
4.	Secondary	25 (71.43%)	8 (22.86%)	2 (5.71%)	-	-	-	35 (100%)
5.	Higher Secondary	44 (75.86%)	14 (24.14%)	-	-	-	-	58 (100%)
6.	Graduation	25 (60.98%)	15 (36.58%)	1 (2.44%)	-	-	-	41 (100%)
7.	Post Graduation	21 (84%)	4 (16%)	-	-	-	-	25 (100%)
TOTAL		150	46	4	-	-	-	200

Table No. 6: Body Mass Index on the basis of education of mother:

S.No.	EDUCATION	STATUS OF BODY MASS INDEX (BMI)						TOTAL
		Under weight BMI <18.5	Normal BMI = 18.5-24.9	Over weight BMI = 25.0-29.9	Obesity/ Grade I BMI = 30.0-34.9	Obesity/ Grade II BMI = 35.0-39.9	Obesity/ Grade III BMI >40	
1.	Illiterate	14 (87.5%)	2 (12.5%)	-	-	-	-	16 (100%)
2.	Primary	25 (78.12%)	6 (18.75%)	1 (3.13%)	-	-	-	32 (100%)
3.	Middle	33 (76.75%)	9 (20.93%)	1 (2.32%)	-	-	-	43 (100%)
4.	Secondary	35 (81.40%)	7 (16.28%)	1 (2.32%)	-	-	-	43 (100%)
5.	Higher Secondary	28 (63.64%)	15 (34.09%)	1 (2.27%)	-	-	-	44 (100%)
6.	Graduation	8 (66.67%)	4 (33.33%)	-	-	-	-	12 (100%)
7.	Post Graduation	7 (70%)	3 (30%)	-	-	-	-	10 (100%)
TOTAL		150	46	4	-	-	-	200

The distribution of status of body mass index on the basis of occupation of father is explained by Table 4. It was found that most of the overweight boys belonged to fathers who were labours; most of the underweight boys belonged to fathers who were skilled labours (86.96%) whereas percentage of underweight boys was less among fathers who were employees in private sectors (70%). Highest percentage (28.26%) of boys who were found to be normal belonged to fathers who were government employees whereas least percentage of normal boys was from employees belonging to other occupations (12.5%).

The distribution of status of body mass index on the basis of father's education is explained in Table 5. It was found that illiterate fathers showed highest percentage of underweight boys whereas least percentage of underweight boys belonged to graduated fathers. Highest percentage of normal boys was associated with graduate fathers whereas least percentage was associated with fathers educated up to middle school.

Table 6 exhibits the status of body mass index on the basis education of mother. It was found that highest percentage of boys from underweight status of body mass index belonged to illiterate mothers whereas mothers who schooled up to higher secondary showed the least percentage of underweight. Highest percentage of boys from normal status of body mass index belonged to higher secondary schooled mothers whereas least percentage of normal status of body mass index was found among boys from illiterate mothers.

## CONCLUSION

The result shows that 75% of the total boys were found to be underweight whereas only 23% are found to be normal. The height and weight of the boys were found to be less than the ICMR and NCHS standards but more than the ICAR standards. The association of body mass index (BMI) with occupation of father shows that least educated classes, i.e. labours and skilled labours showed very high percentage of underweight boys whereas this percentage was least among boys belonging to employee fathers (both government and private). Contrary to this, it was found that occupational categories of fathers such as business, farming/agriculture and government & private employees showed better percentage of normal body mass index (BMI) among boys as compared to the underweight status of BMI. As far as education of fathers is concerned, it was found that the highest percentage of underweight and belonged to fathers who completed their study up to higher secondary classes and normal boys were from graduate fathers. On the other hand, most of the underweight boys belonged to mothers who studied up to secondary classes whereas highest percentage of normal boys belonged to mothers who studied up to higher secondary level. This brings to the forefront that

Thus, it can be inferred from the present study that both poor economic status and educational background of the parents can possibly be the major contribution of the deteriorated health condition of the adolescent boys of Sagar city.

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