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Physical Growth and Nutritional Status of Rural Preadolescent Girls of Kanpur, Uttar Pradesh

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ABSTRACT

Preadolescence (10-12 years) age is a preparatory stage in the life cycle of an individual when body stores of nutrients are built up in preparation for second growth spurt in life i.e. adolescence. Adolescents are the best human resources. The adolescent girls are very important section of our society as they are our potential mothers and future homemakers. In this period of rapid growth, if a girl is not taken care of, this influences the state of her health throughout life. For many years, their health has been neglected because they were considered to be less vulnerable to disease than the young children or the very old. Anthropometric assessment of physical growth and nutritional status was done using standard tools and techniques. Analysis of the data reveals that 30 per cent rural preadolescent girls were 10 years old, 38 per cent are 11 years old and remaining 32 percent were in their 12th year of life. Height of the rural subjects ranged from 120 to152 cm with the mean of 136.04± 8.34 cm. The results indicate that about 65.6 per cent of girls in the age group 10-12 years were having normal nutritional status

Key Words : Physical growth, Nutritional status, Rural preadolescent

INTRODUCTION

The growth and prosperity of a nation depends heavily on the status and development of girls as they constitute one tenth of its population but also influence the growth of the remaining population (Chaudhary *et al.*, 2009). Among adolescents, girls are more vulnerable, particularly in developing countries including India, due to various adverse socio-cultural and economic reasons. Health and nutrition of adolescent girls did not receive adequate attention especially at rural sectors of India (Das and Biswas, 2005).

The 10-12 year age group is a preparatory stage in the life cycle of an individual when body stores of nutrients are built up in preparation for second growth spurt in life i.e. adolescence.

Rural India needs more attention as 98 per cent of the geographical area of India and

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72.9 per cent of India's population occupy rural area spreading over six lakh villages. India consists of diverse agro-climatic regions and ethnic multiplicities. Socio-cultural practices, lifestyles and eating habits vary not only between states but also between the districts within a state. In India there is wide variation in the growth determinants, it is essential that the normal values are developed region wise and are redefined from time to time.

Updated profiles on physical growth and nutritional status of children especially rural girls are therefore, important for formulation and implementation of appropriate nutrition intervention strategies and policies not only at the state level but also at district and tehsil levels.

Nutritional anthropometry is universally applicable, simple, inexpensive and non-invasive technique, but it is still an under utilized tool for guiding public health policy. Growth monitoring by anthropometric measurements during this rapid growth period is not only an important health indicator but also a predictor of various morbidities in the community.

The physical growth can be measured using various anthropometric parameters. The most widely anthropometric measurements of growth are height (stature) and body weight. Indices could be constructed from raw growth measurements. Anthropometric indices are of increasing importance in nutritional assessment as these measurements are easy, quick and accurate. The pattern of physical growth is similar in all individuals but the rate varies depending upon various genetic and environmental factors.

Adolescents are the best human resources. The adolescent girls are very important section of our society as they are our potential mothers and future homemakers. In this period of rapid growth, if a girl is not taken care of, this influences the state of her health throughout life. About 450 million adult women in developing countries are stunted as a result of childhood protein energy malnutrition (Sinha, 2001). For many years, their health has been neglected because they were considered to be less vulnerable to disease than the young children or the very old. Their health attracted global attention in the last decade only (Kalhan *et al.*, 2010). Non availability of data on physical growth and nutritional status of 10-12 year old rural girls of Kanpur Nagar district prompted to undertake the present study.

METHODOLOGY

In the present study 200 school girls of age 10-12 years were selected using random purposive sampling. Exact age of the subjects was verified from the school records. Rural subjects selected were from villages of *Kalyanpur* block of Kanpur Nagar district. Anthropometric assessment of physical growth and nutritional status was done using standard tools and techniques Lohman *et al.* (1988). The study instruments consisted of a structured questionnaire containing general information of the respondents, weighing scale for weight measurement, an anthropometric rod for height measurement.

Statistical Analysis:

Mean, standard deviation and percentile values were calculated for weight, height and BMI of rural adolescent girls. Z score of BMI was calculated to know the nutritional status of the rural girls.

RESULTS AND DISCUSSION

General information:

Age group of 10- 12 years was divided in to three age's i.e. 10, 11 and 12 years. Age means completed years. The subjects included in the study are whose parents and teachers/ mentors gave permission and had no objection in recording the data. Analysis of the data reveals that 30 per cent rural preadolescent girls were 10 years old, 38 per cent are 11 years old and remaining 32 per cent were in their 12th year of life. Family income per month of rural families ranged from Rs. 2,000 to 20,000 per month. It was found that maximum number of families has monthly income between Rs. 5,001 to 10,000. Out of total families 35.5 per cent were earning less than Rs. 5,000 per month. Number of the family members living under one roof was recorded to assess the family size of the rural girls. Family size of the studied families ranged from 4 to 15. It was found that 40.5 per cent families were having 3 to 4 members in their family, 45 per cent having 5 to 6 members and only 1 per cent family were having more than 10 members in the family.

Table 1 : Personal profile of the subjects (n=200)

Sr. No.	Personal variables			
1.	**Age (years)**	**10**	**11**	**12**
	Percentage (%)	30	38	32
2.	**Religion**			
	Hindu	28	35.5	28.5
	Muslims	02	2.5	3.5
3.	**Caste**			
	General	12	11	9.5
	OBC	12.5	15.5	13.5
	SC	5.5	11.5	9.0
4.	**Father's Education**			
	uneducated	0	0	0
	Primary (up to V)	3.0	2.0	6.5
	Secondary (VI to IX)	14.5	16.0	9.0
	10th class	4.5	10	12
	10+2	8.0	9.0	4.5
	Graduate	0	1.0	0
	Post Graduate	0	0	0

Physical Growth of Subjects:

The most widely anthropometric measurements of growth are height and body weight. Table 2 clearly indicates that the height of the rural subjects ranged from 120 to 152 cm with the mean of 136.04± 8.34 cm.

The body weight of the rural subjects was found to vary from 19 to 42 kg with the mean body weight of 28.3 ±5.84 kg. Sachan *et al.* (2012) reported mean height of 133.12±8.71cm in 10 years old rural girls of Lucknow. A positive linear increasing trend in weight between 10 and 11 years of age, except for 12 year of age was observed. Similar observation has

been reported by Mukhopadhyay *et al.*, 2005, found that *Bengalee* girls showed weight gain between 11 and 14 years of age excluding age 12 years.

Table 2 : Height, weight and BMI of the rural girls

Age (Year)	Height (cm)		Weight (Kg)		BMI (kg/m^2)	
	Mean	50th Percentile	Mean	50th Percentile	Mean	50th Percentile
10	135.53±8.91	136.00	27.57±5.86	26.00	14.89±2.08	14.35
11	136.77±8.45	137.45	29.00±5.67	28.00	15.39±1.88	15.12
12	135.83±7.65	136.00	28.30±5.99	27.00	15.21± 2.18	15.07

Nutritional Status of Subjects:

The results indicate that about 64 to 68 per cent of girls in the age group 10-12 years were having normal nutritional status. It is clearly evident from Table 3 that rural girls with normal nutritional status were 68.33, 64.47 and 64.06 per cent in 10, 11 and 12 years old girls. Interestingly the per cent of subjects categorized as moderately undernourished and over nourished ranged from 13.33 to 18.75 and 17.19 to 19.74 per cent, respectively. This shows that problem of under nutrition and over nutrition are increasing parallel to each other. No severely undernourished subject was found in the study. According to Z score 18.33 per cent of 10 years old, 19.74 per cent of 11 years and 17.19 per cent of 12 years old girls were categorized as overweight. Sachan *et al*. (2012) reported 3.9 per cent prevalence of overweight in rural adolescent girls of *Lucknow*. Obese subjects have not been found in rural area and maximum 18.75 per cent of 12 years old rural girls were found to be moderately undernourished.

Table 3: Nutritional status of rural girls according to the Z-score of BMI

Age (years)	BMI (Z-scores)				
	Severe Nutrition	Under Nutrition	Normal	Over Weight	Obese
	$Z \leq -3$	$-3 < z \leq -1$	$-1 < z < +1$	$+1 \leq z < +3$	$+3 \leq z$
10	0	13.33	68.33	18.33	0
11	0	15.79	64.47	19.74	0
12	0	18.75	64.06	17.19	0

Conclusion:

The present study concludes that the physical growth of rural girls showed no significant increase after the age of 11 years Z score of BMI showed that with increase in age percentage of moderately undernourished girls increased. Severely malnourished preadolescent girls were not found in the study.

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