

Gender Differences in Physical Parameters of Preschoolers

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ABSTRACT The present longitudinal study was undertaken in the rural areas of Hisar district. Two cluster of villages comprising of seven villages each were selected randomly to meet the sample size. A total of 200 pregnant ladies who were in the last trimester of pregnancy were enrolled to have a minimum of 100 children for the longitudinal sample. The children were followed upto 6 years and the physical development of 4-6 years old children has been analyzed here. The results revealed that at all ages mean anthropometric measurements, which constituted weight, height, chest, head and arm circumference of male children were found better than females. The age wise differences in the physical parameters of both the sexes indicated maximum difference in gain in most of the parameters at 5 years of age. This difference was comparatively less at 6 years of age.

INTRODUCTION

A child's ability to perform a physical task is based not only on certain maturational phenomena in the brain but also upon the muscle and skeletal systems. The concept of growth, therefore, involves a sequence of physiological events, which results out of interacting influence of heredity and environment.

Physical growth is one of the more overt and impressive indication of children's development. It is necessary, therefore, to know the normative growth changes. It had an important impact on motor and other aspect of development. An understanding of physical growth reveals various age level uniformities as well as orderliness of growth in the form of age level changes that can be characterized as qualitative, quantitative and sequential. The knowledge of growth and development of human beings from conception to maturity is of paramount importance, as it is an indicator of nation's health and progress. To understand the child we should know the stages of growth and development pattern. To keep in mind above facts, a longitudinal study was started in Hisar district to see the growth pattern of rural children.

METHODOLOGY

District Hisar was selected from Haryana State for the present study. Two villages, one from each of the two blocks of the district, namely Ladwa (Hisar-I) and Rawalwas (Hisar-II) were selected randomly. In order to meet the sample size, six adjacent villages each, were added to the two randomly selected villages, making a total of 14 villages (two clusters of seven villages each). To assess the physical development of children right from birth, the pregnant women (N=200), who were in the last trimester of their pregnancy, were identified and selected in order to have a minimum of 100 children for the longitudinal sample. This study was continued from birth to six years. The data of 4-6 years old rural children on anthropometric measurements were calculated and are presented in the present investigation. The measurements of the five parameters of the longitudinal sample were collected with the help of following tools.

Parameters	Tools used
Height	Anthropometric rod
Weight	Bathroom Scale
Head circumference)	
Chest circumference)	Fibre Glass Measuring Tape
Arm circumference)	

A total of five visits were made per child at the interval of six months i.e. 4, 4 ½, 5, 5 ½, and 6 years of age to assess the trend of the physical development among children during these years.

RESULTS

The anthropometric measurements of 4 to 6 years old rural children were calculated and are described as under:

Weight: The data in table 1 indicated the weight of males and females at all age points i.e. 4.0, 4.5, 5.0, 5.5 and 6.0 years. The results revealed that weight of males at the age of 4 years ranged from 9.0 to 15.5 kg, with an average of 12.31 kg, whereas at the same age females

Table 1: Physical parameters of 4-6 years old rural children

Age	N	Sex	Weight			Height		
			Mean	S.D.	Difference	Mean	S.D.	Difference
4.0	43	M	12.3	1.19	0.6	93.70	3.78	1.3
	33	F	11.7	1.14		92.40	3.69	
4.5	33	M	13.5	1.65	0.7	97.4	2.97	1.3
	28	F	12.8	1.29		96.1	3.67	
5.0	47	M	14.3	1.69	0.8	102.0	3.58	2.7
	43	F	13.5	1.48		99.3	3.86	
5.5	50	M	15.0	1.77	0.5	103.4	3.73	1.8
	34	F	14.5	1.23		101.6	3.64	
6.0	54	M	15.2	1.75	0.4	106.4	3.75	1.4
	46	F	14.8	1.57		105.0	3.81	

ranged from 9.5 to 15.5 kg with an average of 11.70 kg. At the age of 5 years the weight of males ranged from 10.5 to 17.5 kg with an average of 14.3 kg. On the other hand females had a range of 11.0 to 17.0 kg with a mean value of 13.5 kg.

The weight of males at the age of 6 years ranged from 11.5 to 19.0 kg with a mean value of 15.2 kg while in case of females it was found 11.5 to 18.5 kg with an average of 14.8 kg. Further probing of data revealed that the weight of males and females increased with their age, respectively. The increase in weight was found 1 to 1½ kg after a gap of one year. The mean value of weight at all ages indicated that males had higher mean weight than females. Similar observations were reported by Ghosh (1976); Ghai and Sindhu (1968). They also recorded the physical development of infants and observed that the measurements of female children at specific age levels were lower than that of their male counterparts. A maximum difference of 0.8 Kg was evident at 5.0 years of age whereas this difference in gain of weight was minimum at 6 years i.e. 0.4 Kg among 4 to 6 years old preschoolers.

Height: The data in table 1 further spotlighted that at the age of 4, 5 and 6 years the height of male children ranged from 83.7 to 100.8 cm, 89.5 to 109.0 cm and 93.2 to 114.7 cm, respectively. The mean value at all these age were 93.7, 102.5 and 106.4 cm, respectively. It shows that height of males also increases with their age. Whereas the height of females ranged from 84.6 to 100.5 cm with mean value of 92.4 cm at the age of 4 years while at the age of 5 and 6 years, it ranged from 92.4 to 107.3 cm and 95.5 to 115.0 cm with a mean value of 99.3 cm and 105.0 cm, respectively.

It may, thus, again be concluded from the mean value that males were taller than the females at all age levels from four to six years of age. Mishra and Gupta (1978) also reported that boys were taller than girls in all the age groups. The height of children increased with the increase in age, along with the gap between the height of boys and girls. Similar trend as that of sex-wise difference in weight gain was indicated in height gain during 4-6 years of age.

Head Circumference: The head circumference also followed a pattern similar to weight and height as indicated in table 2. The measurements for males of 4 years old, ranged from 45.6 to 51.0 cm and for females, it ranged from 45.0 to 51.4 cm. The head circumference of males of 5.0 years old, ranged from 46.4 to 51.4 cm and that of females ranged from 45.8 to 54.5 cm. Six years old males ranged from 46.4 to 52.6 cm and females ranged from 46.4 to 52.0 cm in their head circumference. It is also clear from mean value that males were again found better in head circumference as compared to females.

Spectacular differences in the head circumference of males and females were observed in 4 to 6 years old children. Pereira et al. (1983) also found male infants having larger values in all the measurements than females. The difference in gain in head circumference was minimum at 6 years of age.

Chest Circumference: Table 2 also indicated the chest circumference of male and female children of 4 to 6 years old. The chest circumference of 4 years old males ranged from 46.0 to 53.4 cm with a mean value of 50.1 cm and that of females ranged from 45.47 to 53.0 cm with a mean value of 48.8 cm. The measurements of males of 5 years old ranged from 46.4 to 56.0

Table 2: Circumference of 4-6 years old rural children

Age	N	Sex	Circumferences								
			Head			Chest			Arm		
			Mean	S.D.	Diff.	Mean	S.D.	Diff.	Mean	S.D.	Diff.
4.0	43	M	48.5	1.62	0.8	50.1	2.2	1.3	14.4	0.84	0.2
	33	F	47.7	1.41		48.8	2.02		14.2	0.82	
4.5	33	M	48.9	1.15	1.0	50.9	1.82	1.5	14.5	0.89	0.3
	28	F	47.9	1.43		49.4	2.14		14.2	0.81	
5.0	47	M	49.3	1.28	1.0	51.6	1.97	1.3	14.8	0.93	0.3
	43	F	48.3	1.65		50.3	2.3		14.5	0.90	
5.5	50	M	49.6	1.28	1.0	52.5	2.1	1.4	14.8	0.84	0.2
	34	F	48.6	1.32		51.1	1.84		14.6	0.87	
6.0	54	M	49.8	1.31	0.5	53.3	1.85	1.3	14.9	1.01	0.2
	46	F	49.3	1.38		52.0	2.03		14.7	0.84	

cm with a mean value of 51.6 cm. Females of 6 years old ranged from 49.0 to 57.6 cm with a mean value of 52.0 cm. Following the trend males were again found to be better than females in chest circumference though the differences were negligible.

The sex-wise difference in chest circumference was maximum at 4-5 years of age among various age cohorts.

Arm Circumference: Arm circumference of males at the age of 4 years ranged from 12.0 to 16.8 cm with a mean value of 14.4 cm whereas for females it ranged from 13.0 to 15.8 cm with a mean value of 14.2 cm (Table 2).

The arm circumference for males at 5 years of age ranged from 13.0 to 17.0 cm with an average of 14.8 cm. Whereas for females it ranged from 13.0 to 17.5 cm with an average of 14.5 cm. At the age of 6 years, males had arm circumference ranging from 12.0 to 17.4 cm with average of 14.9 cm. Whereas for females it ranged from 13.0 to 16.8 cm with an average of 14.7 cm. A slight variation in arm circumference was observed at various ages in males as well as females.

Concludingly, it may be stated that at all ages mean anthropometric measurements of male children were found to be better than females. Ghai and Sindhu (1968) also recorded the physical development of infants and observed that the measurements of female children were lower than that of their males counterparts. Chopdar and Nabarro (1981) found similar results.

Thus, during this period physical growth is less rapid than at earlier age levels. It is also characterized by great changes in the body proportions. Growth of the head and chest regions which was most rapid during the pre-natal and infancy periods has begun to slow down, whereas the development of the arms and legs now becomes rapidly accelerated. By the time the child is five years old his proportions are more like those of adults. Thus, it is that each part of the body grows at a different rate. Each child has his own tempo of growth. Some children grow slower during the early years and faster later. Boys and girls grow at different rates. Girls attain their maximum weight faster than boys.

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