

Physical Growth Status of Primary School going Munda children (5-10 years) of Paschim Medinipur District, West Bengal, India: A Comparative Study between boys and girls

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ABSTRACT

Children are the most important section of the community as they are the future of Humanity. Children are also very vulnerable and need proper care, nutrition and growing condition. If children are not growing properly, then the future of a country or community is not secure. Unfortunately, the children in India are facing many difficulties and as a result, growing poorly. And many studies reported the unavailability of child growth data at the community level. This study aims to assess the Physical growth condition of the Munda children of Paschim Medinipur, West Bengal, India. The present study is cross-sectional, ex-post-facto research. Data were collected using interview and schedule methods. Anthropometric measurements were collected following standard procedures. The present study found that Munda boys and girls are growing equally without any sign of disparity. But their overall growth condition is not satisfactory as significantly lower height and weight can be observed among the study population compared to international growth standards.

Key Words: Anthropometry, Height, Weight, MUAC, HC, Munda, Growth Status

INTRODUCTION

Children are the most valuable section of the community as they encompass hopes and aspirations for our future. Children are also the most vulnerable section of the community (Yadav et al. 2016). Primary school age is a vital period for the physical growth and mental development of the child (Neelu et al. 2009). So it is very important to care for the health and well being of the children (Shashank and Chethan 2016).

Growth studies of children have always received serious attention from medical sciences and biological anthropology all over the world. Standard anthropometric measurements are widely used for the assessment of the growth pattern of children (Banerjee et al. 2017). Best et al. (2010) found that enough data is not available on growth conditions and suggested that it is very important to track height and weight in developing countries and countries in transition. In India, the quality of life of school children continues to be very poor by all standards, especially among rural and slum areas (Shaikh et al. 2016). So the importance of growth studies is far greater as many children suffer from improper growth and development (Srivastava et al. 2012; Roy and Roy 2019). Anthropometry is a very important tool to assess the growth and nutritional status of children (Khopkar et al. 2014; Ali et al. 2015; Pujar et al. 2016; Pal and Bose 2017; Sharma et al. 2017; Rajak et al. 2018)

The physical growth of children is very important and the growth studies provide valuable information about factors affecting growth and development of children (Basu et al. 2014; Syed and Rao 2015). Height and weight are the most important anthropometric measurement which reflects the physical growth condition of children (Bharati et al. 2005). Anthropometry has been widely and successfully applied to the assessment of health and nutritional risk of children (WHO Expert Committee 1995). Many other studies have been conducted in different areas to understand the growth and nutritional status of children (Ibegbu et al. 2013; Kolekar and Sawant 2013; Talwar and Airi 2015; Yadav et al. 2016). Using growth standards to understand the growth condition of children is widely used, as growth standards provide us information about how a child should grow and any deviation from it is clear evidence of abnormal growth (Bhor 2018).

Most of the tribal population in India belongs to low socioeconomic status (Debbarma et al. 2018). As a result the tribal children many times don't get the necessary recourses needed to grow properly and suffer permanently. So it is very important to study the growth conditions of children especially tribal children.

Objective: The objective of the present study is to examine the physical growth conditions of Munda children of Paschim Medinipur, West Bengal, India. This study also tries to compare the physical growth condition of Munda boys and girls to find disparity.

MATERIAL AND METHODS

The present study was conducted among primary school-aged Munda children of Paschim Medinipur, West Bengal, India. The present study is cross-sectional, ex-post-facto research. Data were collected using interview and schedule methods. Anthropometric measurements (Height, Weight, Mid Upper Arm Circumference (MUAC), and Head Circumference (HC)) were collected following standard procedure (Weiner and Lourie 1981). Data were collected between Nov 2017 to Feb 2018 and Oct 2018 to Feb 2019. Ethical clearance was taken from Institutional Ethics Committee (IEC) of West Bengal State University. Data of age is very important in the study of growth and nutritional condition of children. In this study age record was collected from any govt. documents. If not available, then age was confirmed from polio/vaccination card or mother of the children. A total of 442 Munda children was included in this study, among which 208 were boys and 234 were girls. Mean and Standard Deviation (SD) were calculated for every anthropometric measurement. Student's t-tests were performed to examine the mean differences between Munda boys and girls. To assess the growth performance of the present study children, height and weight were compared with international growth standards (NCHS 1997). All the statistical testing was performed using SPSS version 16. For statistical testing $p < 0.05$ were considered statistically significant.

RESULTS:

Table 1 and **Table 2** represent the comparative account of the physical growth of Munda boys and girls concerning height and weight. In mean height and weight, there is no significant difference between Munda boys and girls in any age group. These results indicate similar growth of boys and girls in the study community. Age-wise significant increase in mean height and weight can be observed among boys and girls. **Table 3** shows the differences between mean height and weight between Munda boys and NCHS reference values of boys. The present study boys show much lower mean value compared to NCHS growth standard. In every age group, the differences in mean height and weight between Munda boys and NCHS boys are statistically significant.

Table 1: Differences of mean height between Munda boys and girls

Differences in mean height of Munda boys and girls							
Age (in years)	Boys			Girls			t value
	n	Mean (cm)	SD (cm)	n	Mean (cm)	SD (cm)	
5	30	103.99	6.81	30	104.06	5.52	0.044
6	41	107.94	5.50	50	108.09	6.01	0.120
7	30	115.00	7.01	38	114.98	6.56	0.013
8	38	120.24	7.02	36	122.57	6.67	1.465
9	41	123.94	7.57	50	124.42	6.73	0.324
10	28	131.36	6.83	30	130.92	6.54	0.249
F value	72.093*			92.609*			

Table 2: Differences of mean weight between Munda boys and girls

Differences in mean weight of Munda boys and girls							
Age (in years)	Boys			Girls			t value
	n	Mean (kg)	SD (kg)	n	Mean (kg)	SD (kg)	
5	30	15.80	3.42	30	15.10	2.52	0.904
6	41	16.25	2.03	50	15.98	2.47	0.569
7	30	17.73	1.89	38	17.34	2.87	0.644
8	38	20.79	2.56	36	21.00	4.06	0.261
9	41	22.60	4.17	50	22.34	4.02	0.299
10	28	24.95	3.73	30	24.77	3.73	0.183
F value	46.651*			47.821*			

*p<0.05

In **Table 4**, we can see the age group wise differences in mean height and weight between Munda girls and NCHS reference values of girls. Here also we can see that the present study girls show slower growth on height and weight compared to NCHS girls. The differences in mean height and weight in all age group is statistically significant. So it is clear that the present study children are not growing equally to the international standards.

Table 5 shows the differences in MUAC and HC between Munda boys and girls. Though the differences in the mean MUAC between boys and girls are not statistically significant in any age group, girls show higher mean values compared to boys in most age groups. Higher HC values were found among boys. The differences in mean HC between boys and girls are statistically significant in 8 years ($t=2.85$; $p<0.05$) and 10 years ($t=2.14$; $p<0.05$) age group. The Munda boys show slightly better result on mean HC values and girls show better result in case of mean MUAC values.

Table 3: Comparison to mean height and weight between present study and NCHS boys

Age group (yr.)	Study group	Height			t value	Weight			t value
		n	Mean	SD		n	Mean	SD	
5	Present study	30	103.99	6.81	9.34*	30	15.80	3.42	7.27*
	NCHS	146	113.0	4.3		146	20.26	2.98	
6	Present study	41	107.94	5.50	8.70*	41	16.25	2.03	9.62*
	NCHS	81	117.8	6.1		81	21.92	3.48	
7	Present study	30	115.00	7.01	7.80*	30	17.73	2.56	8.87*
	NCHS	84	124.5	5.2		84	24.51	4.02	
8	Present study	38	120.24	7.02	7.88*	38	20.79	2.56	8.72*
	NCHS	74	129.3	5.0		74	26.36	3.48	
9	Present study	41	123.94	7.57	8.78*	41	22.60	4.17	7.33*
	NCHS	84	134.3	5.4		84	30.65	6.39	
10	Present study	28	131.36	6.83	6.27*	28	24.95	3.73	6.89*
	NCHS	89	139.8	6.0		89	33.77	6.42	

*p<0.05

Table 4: Comparison to mean height and weight between present study and NCHS girls

Age group (yr.)	Study group	Height			t value	Weight			t value
		n	Mean	SD		n	Mean	SD	
5	Present study	30	104.06	5.52	7.64*	30	15.10	2.52	6.8*
	NCHS	154	112.2	5.3		154	19.57	3.41	
6	Present study	50	108.09	6.01	10.48*	50	15.98	2.47	10.78*
	NCHS	81	118.5	5.2		81	21.73	3.23	
7	Present study	38	114.98	6.56	8.23*	38	17.34	2.87	10.01*
	NCHS	89	124.4	5.6		89	24.14	3.74	
8	Present study	36	122.57	6.67	4.84*	36	21.00	4.06	6.32*
	NCHS	79	128.3	5.5		79	26.64	4.59	
9	Present study	50	124.42	6.73	10.05*	50	22.34	4.02	10.29*
	NCHS	77	135.6	5.7		77	31.15	5.11	
10	Present study	30	130.92	6.54	6.28*	30	24.77	3.73	7.51*
	NCHS	95	140.3	7.3		95	34.20	6.53	

*p<0.05

Table 5: Differences between Munda boys and girls in mean MUAC and Head circumference

Age group (yr.)	Sex	MUAC			t value	Head Circumference			t value
		n	Mean	SD		n	Mean	SD	
5	Boys	30	15.14	1.29	1.33	30	48.09	1.34	1.77
	Girls	30	14.74	1.02		30	47.30	2.04	
6	Boys	41	14.79	0.49	1.86	41	47.63	2.15	0.13
	Girls	50	15.45	2.22		50	47.57	2.59	
7	Boys	30	15.18	0.92	1.09	30	48.27	1.80	1.66
	Girls	38	15.46	1.19		38	47.55	1.76	
8	Boys	38	16.51	1.13	0.13	38	49.45	1.93	2.85*
	Girls	36	16.55	1.44		36	48.34	1.31	
9	Boys	41	16.73	1.31	0.32	41	48.97	1.27	0.08
	Girls	50	16.84	1.74		50	48.94	1.58	
10	Boys	28	17.33	1.29	0.34	28	50.07	1.28	2.14*
	Girls	30	17.20	1.68		30	49.31	1.39	

*p<0.05

DISCUSSION:

Growth of children depends on many factors; one of the most important among them is proper nutrition (Manna 2014). Growing children need proper nourishment (Das et al. 2014), improper nutrition leads to ill-health and reduced physical growth. The physical growth of children is an excellent measure of health and nutrition of children. Average values of height and weight indirectly show the overall public health condition and nutritional status of the people (Saha and Sil 2018). Among all the deprived communities in India, tribal communities are the most vulnerable section (Saha and Sil 2019). The growth and nutritional situation of Indian children are not up to the mark, especially the tribal children. But enough data is not available and need rigorous studies.

The present study found that the Munda boys and girls were growing similarly. No evidence of disparity was found in anthropometric indicators. In height, age wise significant increase was found in both boys and girls. Though in most age groups girls show higher mean height compared to boys, but the differences are not statistically significant in any age group. Very similar results can be observed in case of mean weight of Munda boys and girls. Similar mean weight can be observed, which means that the boys and girls are growing similarly. In MUAC, girls show higher mean values compared to boys in most age groups, but the differences are not statistically significant. In the HC, boys show higher mean values, but the differences are not statistically significant in Most age groups, except 8 years ($t=2.85$; $p<0.05$) and 10 years ($t=2.14$; $p<0.05$) age group. Many studies in India reported similar growth pattern between boys and girls (Chakraborty et al. 2008; Pal and Bose 2017; Roy and Roy 2019), while others found significant differences (Manna et al. 2011). Similar growth conditions to the present study children can be observed in some other studies conducted in tribal and slum areas (Medhi et al. 2006; Srivastava et al. 2012; Basu et al. 2014; Roy and Roy 2019). Whereas, other studies, especially in urban and affluent areas show much better physical growth condition of children (Bharati et al. 2005; Banerjee et al. 2009; Banerjee et al. 2017).

The differences in physical growth between boys and girls are not statistically significant on most of the anthropometric indicators. But compared to international growth standards the present study children show slower physical growth. In all age groups, Munda boys and girls show very high mean-deficit in height and weight. In all age groups Munda children show statistically significant lower mean height and weight compared to NCHS standard. This

implies that the Munda children are facing very difficult growth condition with slower or retarded physical growth. Many other studies reported lower physical growth of Indian children compared to growth standard, especially children of rural and tribal area (Vashisht et al. 2005; Bose et al. 2007; Roy and Roy 2019).

Conclusion

Munda boys and girls were growing equally and no sign of disparity to the girls can be found in the study area. The absence of disparity does not necessarily mean that the Munda boys and girls are growing properly. Present study children show much lower mean height and weight compared to international growth standards (NCHS). The results indirectly indicate that many of the study children are facing growth difficulties as a result, suffering from slower or retarded physical growth. So it is clear that the physical growth condition of the Munda children is not satisfactory compared to international growth standards. Immediate attention is necessary to solve the growth problems of Munda children. Other studies should be conducted to understand the situation in depth.

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