PRINT: ISSN 0975-1270 ONLINE: ISSN 2456-6306
J Life Science, 11(1-2): 31-40 (2019)
DOI: 10.31901/24566306.2019/11.1-2.245

A Comparative Study of Physical Growth of Primary School Going Santhal Boys and Girls (6 to 10 years) of Paschim Medinipur, West Bengal

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KEYWORDS Growth Pattern. Height. Weight. Sex Difference. Anthropometry

ABSTRACT The study of growth and physical development is very important as it provides valuable information about the overall health of the children as well as their community and country. This cross-sectional study was conducted to understand the physical growth condition of Santhal children. The present study also tries to depict the gender disparity in the physical growth of the study children. A total of 300 Santhal children were studied (150 Boys and 150 girls). Interview, Schedule and Observation method and standard anthropometric measurements were used to collect the data and measure the participants. It was observed from the result that Santhal boys and girls show similar physical growth in most of the age-sex groups which indicate gender equality in physical growth. But the overall growth condition of Santhal children was below the satisfactory level.

INTRODUCTION

Growth implies measurable changes in the body size, shape, composition, etc. (Manna 2014). Studies on physical growth and development of children are very important as they provide determinants of child growth and nutrition as well as the overall health condition of the community. Even the most developed countries regularly monitor the physical growth patterns of the children. In developing countries, including India, the importance of growth studies are far greater as many children don't get proper nutrients and suffer from improper growth and development. Height and weight measurements are the simplest and one of the most reliable ways to evaluate normal child growth. Height and weight can also be used to detect abnormalities in growth when no other clinical sign of illness is detected (Kolekar and Sawant 2013).

The growth of children is influenced by biological and/or socio-economic and environmental factors. Some of these factors are unchangeable whereas others depend on society, family, parents and the total way of life. Most of the abnormal growth is caused by factors like nutritional deficiencies, parasitic infections, and psychosocial illnesses, which can be easily preventable. But in India, these preventable factors are causing improper growth and under development among millions of children which are undesirable and most alarming. This result can be observed in many studies from different corners of India, especially among the tribal children (Medhi et al. 2006; UNICEF 2015; Das et al. 2016; Debbarma et al. 2018).

A study by Medhi et al. (2006) among school-aged children of tea garden workers of Assam found that in all age groups study participants show much inferior growth compared to NCHS standard as well as Indian affluent children. Another study found that physical growth is lower among Garhwali girls compared to well-nourished Indian girls and the difference are very high (Vashisht et al. 2005). School going children of North Bengal also shows lower physical growth than the ICMR standard (Manna et al. 2011). Another study in North Bengal depicts

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malnutrition and gender difference in malnutrition among children (Mondal and Sen 2009). Many other studies reported lower physical growth among Indian tribal children (Xaxa 2011; Sukhdas et al. 2013; UNICEF 2015). Most of the studies done among Santhal children reported improper growth and malnourishment (Chakraborty et al. 2008; Das and Bose 2011; Ghosh and Pati 2015).

A community, as well as a country's future depends on its children, as today's children will become tomorrow's citizens and run the country. If the children of a community or a country don't get the chance to grow optimally the country will never prosper. Many other studies have been conducted to examine the child-growth status in different ethnic groups (Bose et al. 2005; Bose et al. 2008; Biswas et al. 2014; Khopkar et al. 2014; Das et al. 2016; Talwar and Airi 2015; Eze et al. 2016). It is clear from the above literature that millions of Indian children are not growing optimally. Though the situation is alarming, community-wise and chronological studies were rare in most of the areas.

Objectives

The objective of this study is to understand the growth patterns of the study population. This study will also compare the physical growth of the Santhal boys and girls to understand the sex difference in growth. The growth of present study participants will also be compared with other growth standards to get a better view of the growth condition of the study participants.

METHODOLOGY

A cross-sectional study was conducted among 300 Santhal children of five villages of Kharagpur II block of Paschim Medinipur District, West Bengal, India. Only primary school-aged Santhal children (6-10 years) were selected for this study and other community and age group children were excluded. All the data were collected between April 2018 and June 2018. The purpose and the procedures of data collection were explained to the school Headteacher and parents of the children. Verbal consent was taken from the parents of the children. The structured schedule, interview and observation method were used to collect the data. Anthropometric measurements like height, weight, mid-upper arm circumference (MUAC), head circumference (HC), sitting height, biceps skinfold (BSF), triceps skinfold (TSF) and calf skinfold (CSF) were taken from each study participants following standard procedure (Weiner and Lourie 1981). Determining age is very important in growth studies. But sometimes very difficult as in many cases, no document of birth records is found especially in rural/remote areas and underdeveloped communities. This study also faced similar problems in some cases. Mostly birth data were collected from birth certificates, immunization cards or school records. If no documents were available, then data were collected from the mothers of the children. Mean and standard deviation (SD) were calculated for each anthropometric variable. Students' t-test was performed to measure the mean difference in anthropometric characteristics of Santhal boys and girls. The mean height and weight of present study participants were compared with the international growth standard (NCHS 1977). Percentile distribution is also calculated and presented in the growth chart. For statistical testing p-value<0.05 was considered as statistically significant.

RESULTS

Table 1 represents the age-wise distribution of mean height and weight of the study participants. This table also shows the mean difference in the height and weight of Santhal boys and girls. Here from this table, it is evident that with the increase in age, height and weight of both boys and girls increases. A similar type of growth was observed among both boys and girls. Boys show a better mean value in all age groups except 9 years for height. In the case of weight similar results were found. The mean difference in height and weight of all the age groups was statistically not significant, which indicates no sex difference in physical growth.

In Table 2 mean and SD of MUAC, sitting height, head circumference (HC) and BMI were distributed age group wise. In the case of MUAC, age-wise increase in mean value is observed. In 6+ and 10+ age group, boys show higher MUAC mean value than the girls and in other age groups

Table 1: Mean differences in height and weight between Santhal boys and girls

Differences in Mean Height (cm)

Age in years	*Boys*			*Girls*			*t value*	*p value*
	No.	*Mean*	*SD*	*No.*	*Mean*	*SD*		
6+	30	110.755	5.3422	30	110.207	5.7467	0.382	0.704
7+	30	117.923	4.7761	30	117.253	5.0382	0.527	0.600
8+	30	121.230	6.8880	30	121.103	6.0445	0.076	0.940
9+	30	123.760	5.7303	30	126.380	4.4319	-1.981	0.052
10+	30	132.717	7.8868	30	130.250	6.4590	1.325	0.190

Differences in Mean Weight (kg)

Age in years	*Boys*			*Girls*			*t value*	*p value*
	No.	*Mean*	*SD*	*No.*	*Mean*	*SD*		
6+	30	16.150	2.3967	30	15.500	2.0595	1.127	0.265
7+	30	18.933	2.2733	30	18.167	2.3769	0.527	0.600
8+	30	20.033	3.0904	30	19.450	3.1795	0.721	0.474
9+	30	21.367	3.3885	30	22.333	4.1633	-0.986	0.328
10+	30	26.027	5.1683	30	24.200	3.7729	1.564	0.123

Note: $^{*}p<0.05$

Table 2: Mean difference in Mid Upper Arm Circumference (MUAC), Sitting Height, Head Circumference (HC) and Body Mass Index (BMI) between Santhal boys and girls (Sample size =30 in each age-sex group)

Age in years	*MUAC (cm)*				*t value*	*Sitting Height (cm)*				*t value*
	Boys		*Girls*			*Boys*		*Girls*		
	Mean	*SD*	*Mean*	*SD*		*Mean*	*SD*	*Mean*	*SD*	
6+	14.761	1.256	14.731	1.374	0.088	57.817	3.530	57.647	3.972	0.175
7+	15.493	1.350	15.557	1.333	-0.241	61.427	2.986	60.737	3.413	0.833
8+	15.610	1.402	15.807	1.461	-0.532	63.200	3.943	62.830	3.541	0.382
9+	15.863	1.779	16.083	1.497	-0.518	62.997	9.366	65.097	3.358	-1.156
10+	17.010	1.674	16.550	1.551	1.104	68.360	4.265	66.860	4.101	1.388
Age in years	*Head Circumference (cm)*				*t value*	*BMI (kg/mt²)*				*t value*
	Boys		*Girls*			*Boys*		*Girls*		
	Mean	*SD*	*Mean*	*SD*		*Mean*	*SD*	*Mean*	*SD*	
6+	49.523	1.163	47.857	1.367	5.084*	13.105	1.085	12.751	1.248	1.175
7+	49.850	1.523	49.520	2.297	0.656	13.681	1.301	13.507	1.145	0.549
8+	48.940	5.039	48.883	1.420	0.59	13.571	1.188	13.212	1.547	1.009
9+	49.733	1.392	49.763	1.536	-0.079	13.881	1.334	13.939	2.115	-0.126
10+	50.557	1.689	50.392	1.097	0.449	14.698	1.930	14.203	1.371	1.145

Note: $^{*}p<0.05$

(7+, 8+, 9+) girls show higher mean value for MUAC. Though the girls show better results in MUAC, the sex difference in mean MUAC is not statistically significant. In the case of sitting height, boys show higher mean values than the girls in all age groups except for the 9+ year age group. The mean difference between boys and girls in terms of sitting height is not statistically significant. In head circumference, similar results were found. The girls showed higher mean val-

ue in 9+ age groups, in other age groups, the mean head circumference of boys was greater. In BMI also boys have a higher value than girls, but very little difference was found and the sex difference was not statistically significant.

Table 3 depicts the age group-wise distribution of mean and SD of biceps and triceps skinfold of Santhal boys and girls. Here we can see girls have a higher value for biceps skinfold in all the age groups compared to boys. With age, biceps skinfold increased in girls. But in boys, some fluctuation can be noticed, though they have an overall pattern of increase with age but not as prominent as in girls. Also in triceps skinfold, girls have higher values in most of the age groups (6+, 7+, 8+, 9+), except in the 10+ age group. Girls have a much higher mean value than boys in most of the age groups.

Table 4 depicts the differences in mean height between present study participants and NCHS (1977) reference. This table gives a better understanding of the overall growth of the study participants compared to the international growth standard. In all groups, with the increase of age, height also increases. All age-sex groups show a huge difference in mean height and present study participants (both boys and girls) show a much lower mean height than the NCHS (1977) standard. The mean difference in height between present study participants and NCHS (1977) reference is statistically significant in all age-sex groups. In girls, the gap between mean height increases with the increasing age.

Table 5 depicts the age-sex group-wise comparison of the mean weight between the present study participants and NCHS reference data. This table provides a better understanding of the overall growth condition of the study population. In both boys and girls with an increase in age, weight also increased. The mean weight of the present study boys and girls in all age groups is much lower than the NCHS (1977) growth reference. The difference in the mean weight is very alarming. And in all age groups for both boys and girls, the difference in mean weight among the present study, children and NCHS (1977) reference data is statistically significant.

Tables 6 and 7 represent the percentile distribution of height and weight of boys and girls of the present study. The 50th percentile value of WHO (2007) and 50th percentile value of NCHS (1977) was also given in the table to get better clarity in the growth condition of the study participants. In the height percentiles, the WHO (2007) and NCHS (1977) 50th percentile data come very close to the 95th percentile height of the present study population. From this result, it is very clear that very few children of the study

Table 3: Age wise distribution of mean and SD of biceps and triceps skinfold and sex differences

Differences in Mean Biceps Skinfold (mm)

Age in years	*Boys*			*Girls*			*t value*	*p value*
	No.	*Mean*	*SD*	*No.*	*Mean*	*SD*		
6+	30	3.977	1.1988	30	4.020	0.8700	-0.160	0.873
7+	30	3.527	0.6247	30	4.453	1.1720	-3.822*	0.000
8+	30	3.580	0.7563	30	4.721	2.2886	-2.593*	0.012
9+	30	3.680	1.2721	30	4.940	1.6107	-3.363*	0.001
10+	30	4.193	1.0352	30	5.028	2.4334	-1.729	0.089

Differences in Mean Triceps Skinfold (mm)

Age in years	*Boys*			*Girls*			*t value*	*p value*
	No.	*Mean*	*SD*	*No.*	*Mean*	*SD*		
6+	30	6.340	1.641	30	6.613	1.5186	-0.660	0.512
7+	30	5.927	1.2643	30	7.180	1.9443	-2.960*	0.004
8+	30	5.813	1.6162	30	7.260	2.6424	-2.558*	0.013
9+	30	6.060	2.2671	30	8.093	2.5498	-3.216*	0.002
10+	30	7.227	2.5498	30	7.093	3.3259	0.174	0.862

Note: *$p<0.05$

Table 4: Comparisons of the mean height of present study boys and girls with the National Center for Health Statistics (NCHS 1977) reference data

Comparison of Mean Height (cm) of Boys							
Age (years)	*NCHS*			*Present Study*			
	No.	*Mean*	*SD*	*No.*	*Mean*	*SD*	*t value*
6+	294	118.3	4.6	30	110.8	5.3	7.43*
7+	327	124.4	5.4	30	117.9	4.8	7.56*
8+	307	130.0	5.4	30	121.2	6.9	5.24*
9+	308	135.4	6.6	30	123.8	5.7	10.55*
10+	297	140.1	6.4	30	132.7	7.9	4.97*
Comparison of Mean Height (cm) of Girls							
Age (years)	*NCHS*			*Present Study*			
	No.	*Mean*	*SD*	*No.*	*Mean*	*SD*	*t value*
6+	278	117.6	5.6	30	110.2	5.3	6.22*
7+	316	123.7	5.6	30	117.2	4.8	3.57*
8+	312	129.1	6.6	30	121.1	6.9	6.9*
9+	294	135.6	7.0	30	126.4	5.7	10.11*
10+	307	140.6	7.2	30	130.3	7.9	8.17*

Note: *p<0.05

Table 5: Comparisons of the mean weight of present study boys and girls with NCHS (1977) reference data

Comparison of Mean Weight (kg) of Boys							
Age (years)	*NCHS*			*Present Study*			
	No.	*Mean*	*SD*	*No.*	*Mean*	*SD*	*t value*
6+	294	21.76	3.02	30	16.2	2.4	11.91*
7+	327	24.67	4.06	30	18.9	2.3	12.08*
8+	307	27.87	4.71	30	20.0	3.1	12.74*
9+	308	31.20	6.74	30	21.4	3.4	13.42*
10+	297	33.63	6.32	30	26.0	5.2	7.38*
Comparison of Mean Weight (kg) of Girls							
Age (years)	*NCHS*			*Present Study*			
	No.	*Mean*	*SD*	*No.*	*Mean*	*SD*	*t value*
6+	278	21.45	3.61	30	15.5	2.0	14.29*
7+	287	24.44	4.31	30	18.2	2.4	12.4*
8+	324	27.41	5.22	30	19.5	3.2	12.15*
9+	281	31.52	7.02	30	22.3	4.2	10.57*
10+	283	34.94	8.05	30	24.2	3.8	12.74*

Note: *<0.05

participants attained the average growth according to these international growth references. The 5th and 95th percentile value shows high fluctuation compared to other percentiles. Similar results can be observed in the weight percentile. But in weight percentiles, the result is even

Table 6: Percentile distribution of Height of present study boys and girls

Percentile for Height of Boys (in cm)							
Age (in years)	*5th percentile*	*25th percentile*	*50th percentile*	*75th percentile*	*95th per centile*	*WHO 50th percentile (2007)*	*NCHS 50th percentile (1977)*
6+	101.1	107.2	111.2	114.7	119.2	118.9	118.4
7+	111.1	113.9	117.0	120.5	128.6	124.5	124.4
8+	109.9	117.8	119.9	124.2	138.0	129.9	129.8
9+	114.5	120.1	122.0	128.6	136.5	135.2	135.5
10+	119.6	127.9	132.2	137.2	147.6	140.4	140.4
Percentile for Height of Girls (in cm)							
Age (in years)	*5th percentile*	*25th percentile*	*50th percentile*	*75th percentile*	*95th per centile*	*WHO 50th percentile (2007)*	*NCHS 50th percentile (1977)*
6+	98.4	106.1	111.1	114.6	120.2	118.0	117.5
7+	108.8	113.9	116.1	121.7	125.8	123.7	123.7
8+	109.7	115.9	121.6	127.0	128.2	129.5	129.5
9+	119.8	122.4	126.6	130.0	135.2	135.5	134.9
10+	120.4	125.7	129.3	134.5	143.8	141.8	140.9

worse, as, in weight, even the 95th percentile value of study participants was lower than the 50th percentile value of the growth references. Though most of them show below normal and normal growth, few obtained above-average growth in the case of height and weight.

Table 7: Percentile distribution of weight of present study boys and girls

Percentile for Weight of Boys (in kg)							
Age (in years)	*5th percentile*	*25th percentile*	*50th percentile*	*75th percentile*	*95th per centile*	*WHO 50th percentile (2007)*	*NCHS 50th percentile (1977)*
6+	13.0	14.0	16.0	18.0	21.5	21.7	21.4
7+	15.0	17.0	19.0	21.0	23.0	24.1	24.2
8+	15.6	18.0	19.0	22.3	26.5	26.7	27.2
9+	16.6	19.8	20.0	23.3	30.5	29.6	29.7
10+	20.0	22.0	26.0	27.0	38.6	—	32.8
Percentile for Weight of Girls (in kg)							
Age (in years)	*5th percentile*	*25th percentile*	*50th percentile*	*75th percentile*	*95th per centile*	*WHO 50th percentile (2007)*	*NCHS 50th percentile*
6+	12.0	14.0	15.0	16.1	20.4	21.2	21.1
7+	15.0	17.0	18.5	21.0	23.0	23.6	23.8
8+	15.0	17.0	19.3	21.3	25.8	26.6	26.9
9+	18.0	20.0	21.5	23.3	34.1	30.0	30.0
10+	19.6	21.0	23.0	27.0	32.4	—	34.0

DISCUSSION

The physical growth of children is extensively used to examine the health, and development of children. The physical growth of children also indirectly reflects the overall health and nutritional status of a population (Bisai et al. 2008). For any country's development, children are the biggest investment as they are the future manpower (Shaikh et al. 2016). Constant monitoring of child growth is very essential to detect issues/problems in the growth and overall health condition of the children as well as the community. There is an immediate necessity to control malnutrition among school-age children in India (Bhor 2018). Reliable data on child growth is a prerequisite for monitoring and improving child health (Pandve and Singru 2012). In some studies, it was observed that Indian children can grow equally compared to national and international standards (Khadilkar et al. 2009). But most studies report lower physical growth compared to the international reference (Medhi et al. 2006; Vashisht et al. 2005; Manna et al. 2011; Chakraborty et al. 2008).

In Tables 8 and 9, the mean height and weight of boys and girls (aged 6+ to 10+ years) of different studies including present study and NCHS (1977) reference are shown. Affluent children of India (Khadilkar et al. 2009) show a very similar mean height compared to the NCHS (1977) growth standard. Whereas other rural and tribal community studies (Medhi et al. 2006; Chakraborty et al. 2009; Manna et al. 2011; Kaushik et al. 2012; Pal and Bose 2017; Debbarma et al. 2018), including the present study, show much lower growth in children in terms of mean height compared to NCHS (1977). The present study boys and girls show lower height and weight than NCHS (1977), affluent Indian children (Khadilkar et al. 2009) and most other studies. In weight, a similar type of results can be noticed.

Table 8: Height of boys and girls in different studies in India and NCHS standard (6+ to 10+ years)

Mean Height of Boys (in cm)

Different Studies	*Age Group Wise Mean Height (SD)*				
	6+	*7+*	*8+*	*9+*	*10+*
Tea labors child (Medhi et al. 2006)	109.5 (5.4)	116.8 (8.2)	120.5 (7.0)	125.6 (8.4)	128.9 (7.3)
Santhal child (Chakraborty et al. 2008)	112.2 (2.4)	120.5 (2.2)	122.3 (2.7)	126.5 (3.5)	132.1 (2.5)
Affluent child (Khadilkar et al. 2009)	118.0*	123.9*	129.8*	134.9*	139.7*
School children (Manna et al. 2011)	109.8 (3.0)	115.6 (3.7)	119.0 (3.3)	122.1 (4.3)	125.3 (5.6)
Rural children (Kaushik et al. 2012)	111.4 (4.4)	120.2 (4.6)	125.9 (5.9)	127.9 (5.1)	127.9 (4.1)
Rural children (Pal and Bose 2017)	113.6 (5.9)	117.7 (5.7)	122.9 (5.3)	125.4 (5.3)	127.7 (6.0)
Tribal children (Debbarma et al. 2018)	114.3 (3.5)	119.9 (4.7)	123.9 (4.4)	134.0 (6.9)	131.6 (7.2)
NCHS 1977	118.3 (4.6)	124.4 (5.4)	130.0 (5.4)	135.4 (6.6)	140.1 (6.4)
Present study	110.8 (5.3)	117.9 (4.8)	121.2 (6.9)	123.8 (5.7)	132.7 (7.9)

Mean Height of Girls (in cm)

Different Studies	*Age Group Wise Mean Height (SD)*				
	6+	*7+*	*8+*	*9+*	*10+*
Tea labors child (Medhi et al. 2006)	108.9 (6.4)	114.9 (6.9)	119.9 (6.0)	124.7 (6.2)	128.8 (5.1)
Santhal child (Chakraborty et al2008)	109.9 (1.6)	119.4 (2.1)	120.9 (1.2)	121.2 (2.2)	127.0 (4.5)
Affluent child (Khadilkar et al. 2009)	116.1*	122.2*	128.3*	134.1*	140.1*
School children (Manna et al. 2011)	110.0 (2.9)	116.4 (5.0)	120.8 (4.8)	123.6 (4.5)	128.6 (7.0)
Rural children (Kaushik et al. 2012)	114.1 (4.5)	120.5 (5.3)	123.5 (3.8)	125.6 (6.1)	133.3 (5.3)
Rural children (Pal and Bose 2017)	112.2 (5.1)	114.2 (5.0)	122.8 (6.0)	126.1 (6.5)	123.1 (8.0)
Tribal children (Debbarma et al. 2018)	111.7 (2.4)	118.3 (5.5)	120.5 (3.6)	124.0 (3.6)	130.8 (6.8)
NCHS 1977	117.6 (5.6)	123.7 (5.6)	129.1 (6.6)	135.6 (7.0)	140.6 (7.2)
Present study	110.2 (5.7)	117.2 (5.0)	121.1 (6.0)	126.4 (4.4)	130.3 (6.5)

Note: *50^{th} percentile

Table 9: Weight boys and girls in different studies in India and NCHS (1977) standard (6+ to 10+ years)

Mean Weight of Boys (in kg)

Different studies	*Age Group Wise Mean Height (SD)*				
	6+	*7+*	*8+*	*9+*	*10+*
Tea labors children (Medhi et al. 2006)	16.5(2.2)	18.6(3.2)	20.2(3.2)	21.9(4.6)	23.6(3.5)
Santhal children (Chakraborty et al. 2008)	17.7(0.6)	20.9(0.6)	21.3(1.0)	22.5(1.1)	24.6(1.6)
Affluent children (Khadilkar et al. 2009)	21.1*	23.9	27.0*	30.1*	33.5*
School children (Manna et al. 2011)	18.6(1.4)	19.3(0.1)	20.8(0.4)	22.5(0.1)	22.7(3.5)
Rural children (Kaushik et al. 2012)	16.4(1.7)	19.4(2.0)	21.7(3.6)	22.0(2.6)	23.9(3.0)
Rural children (Pal and Bose 2017)	17.6(2.3)	19.2(4.1)	20.7(2.9)	22.7(3.8)	23.22.6)
Tribal children (Debbarma et al. 2018)	18.2(1.4)	22.5(3.4)	21.8(4.0)	23.6(4.5)	28.0(3.6)
NCHS 1977	21.8(3.0)	24.7(4.0)	27.9(4.7)	31.2(6.7)	33.6(6.3)
Present study	16.2(2.4)	18.9(2.3)	20.0(3.1)	21.4(3.4)	26.0(5.2)

Mean Weight of Girls (in kg)

Different studies	*Age Group Wise Mean Height (SD)*				
	6+	*7+*	*8+*	*9+*	*10+*
Tea Labors children (Medhi et al. 2006)	15.9(2.2)	18.2(2.7)	19.7(2.9)	20.6(3.4)	23.4(3.1)
Santhal children (Chakraborty et al. 2008)	16.3(0.7)	18.7(0.8)	21.1(0.8)	20.5(1.0)	22.8(1.6)
Affluent children (Khadilkar et al. 2009)*	19.9*	22.8*	26.1*	29.7*	33.9*
School children (Manna et al. 2011)	18.4(2.0)	19.3(2.1)	20.7(3.1)	22.5(4.1)	24.0(4.2)
Rural children (Kaushik et al. 2012)	16.6(1.8)	18.6(2.1)	19.6(2.1)	21.9(2.5)	26.7(4.0)
Rural children (Pal and Bose 2017)	16.8(1.2)	17.3(1.9)	20.9(3.7)	21.8(3.4)	21.6(3.2)
Tribal children (Debbarma et al. 2018)	16.3(2.1)	20.3(4.7)	19.3(2.8)	19.6(2.5)	24.3(4.3)
NCHS 1977	21.5(3.6)	24.4(4.3)	27.4(5.2)	31.5(7.0)	34.9(8.0)
Present study	15.5(2.1)	18.2(2.4)	19.5(3.2)	22.3(4.2)	24.2(5.2)

Note: *50th percentile

And the mean weight of the present study boys and girls, shows a much lower value compared to most other studies. From this table, it is clear that the rural and tribal community children are facing difficulties in terms of physical growth. And it can also be noticed that rural children (Kaushik et al. 2012) show a slightly increased mean height and weight than the present study population.

The children in the present study show lower values in MUAC and skinfold measurements compared to many other studies. (Amruth et al. 2015; Gharib and Rasheed 2009; Bharati et al. 2005). The children in the present study show better growth than slum children (Srivastava et al. 2012). The Santhal boys and girls show a very similar type of growth in most of the anthropometric variables. The difference between boys and girls in most of the anthropometric variables was not statistically significant. This is a very positive result as this indirectly means there is no gender disparity against girls in the study population in terms of food and nutrition. This result is similar to results found in some other studies (Medhi et al. 2006; Fazili et al. 2012). This result is also true in the case of Mean MUAC, HC, sitting height and BMI. In most of the age groups, the mean difference is not statistically significant. This result also indicates similar growth patterns in boys and girls. In the case of the skinfold measurements, girls show better results than boys and in most of the age groups, the difference is statistically significant. But this is also a normal result as generally girls have more subcutaneous fat than boys. Another cause for this result could be the more physical work and activity done by the boys than girls in this area.

Though similar growth patterns were observed between boys and girls. The overall growth of the study children was not satisfactory but alarming. As in each age-sex group, the

children in the present study show much slower growth than the NCHS (1977) standard. Both the height and weight of the study participants were much lower than the NCHS (1977) standard and the mean deficits were large which indicates lower or retarded growth in the study participants.

In percentile distribution, it could be observed that the lower and higher percentiles gap is very large. Though most of the participants showed slow or below average growth rates, there are some with satisfactory growth. This result indicates that with proper nourishment and care these children can get normal or even above average growth. From the percentile tables, it is very clear that nearly all the study participants showed lower height and weight values than the 50th percentile value of international growth reference.

The main cause of retarded growth is the lack of proper nutrition, intestinal parasite infection, carelessness of parents, low socioeconomic status and low awareness about childcare (Firdos et al. 2018; Manna et al. 2011; Kiran et al. 2014). If the children of a country don't get the chance to grow properly, the country can never reach its full potential, as the children are the future of the country. And a child with retired growth will never reach his/her full potential. This scenario is a befitting reality in the Indian context. There is no doubt that India is improving fast and becoming a major country in terms of economy and power. The Indian state, West Bengal is also developing very fast and the change is prominent in recent years. But it is also true that there are sections where little or no progress has been made. The child growth conditions in most of the tribal communities are very alarming, which was shown in many studies in the past and clear from the literature review. And the present study also shows that child growth in the Santhal community is a matter of great concern.

CONCLUSION

In the present study, it was found that no sex difference or gender gap is present in the present study community. But the overall growth is not up to the mark among the study participants as many of them have very slow growth and face difficulties. It is very hard for the government alone to reach the goal without the care and concern of the parents about the growth of their children. Immediate attention is necessary to improve the growth condition of the children from both the government and parents.

RECOMMENDATIONS

New scheme and support programs focused on child growth and nutrition could improve the overall growth condition of children. Awareness programs among parents about child health care, child growth and nutrition are very important to improve the growth condition of the children. More in-depth studies are necessary to understand the child-growth condition, causes of slower growth and ways to obtain proper growth.

LIMITATIONS

The present study is cross-sectional research. The sample size for this study is relatively small. The study area and the number of participants were limited. This study is only focused on the physical growth of the children under study, so other factors were not included in this research.

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Paper received for publication in April, 2019
Paper accepted for publication in May, 2019