

ANTHROPOMETRIC CHARACTERISTICS AMONG BENGALI PRESCHOOL CHILDREN OF JALPAIGURI, WEST BENGAL, INDIA

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Abstract: The present cross-sectional study was conducted among preschool children aged 2-5 years. The principal aim of the present study was to examine the age and sex-specific variations in anthropometric characteristics among preschool children. The Integrated Child Development Scheme (ICDS) centres were randomly selected from various villages of Maynaguri Block, Jalpaiguri district, West Bengal, India. For the present report, nine anthropometric measurements were taken and 4 measurements were calculated by standard procedures. Most of the anthropometric variables show increasing mean values with advancement of age. All the anthropometric variables are higher among boys than the girls. Statistically significant sex differences were found in some anthropometric variables such as height, weight, arm span, sitting height, head circumference and chest circumference and one derived variable that is waist hip ratio, where $p < 0.05$, there was also statistically significant age variation ($p < 0.001$) observed in all anthropometric variables and derived variables except Waist Hip Ratio. The existence of significant age and sex-specific variations of anthropometric characteristics like height, weight and body mass index was found among preschool children. The present study reported that the mean height, weight and body mass index was compatible with the children of regional and national studies. The median height and weight of the both boys and girls of the present study were lower than the international standards like World Health Organisation and National Center for Health Statistics. Appropriate nutritional intervention programs are needed to achieve the full-fledged growth potential among preschool children of the study population.

Keywords: Anthropometric characteristics, Anthropometry, Cross-sectional study, Preschool children, Sex variation.

Introduction

Anthropometric characteristics become more significant when the assessment of appropriate development occurs among preschool children. Anthropometric characters are the indicators of a Population's health (Cole et al., 2005). The human body consists of a skeleton, muscle, skin, organs and cells which increases with age and shows age-related anthropometric variation during the life span. Nutrition plays a vital role in childhood growth and inadequate nutrition is the reason behind child growth faltering or deceleration (Lifshitz, 2009). Inadequate nutrition reduces physical development as well as cognitive development (Warsito et al., 2012). India has the highest number of under-five children in the World. There are 119998000 under five preschool children present in India according

to the UNICEF report 2017. Low socio-demographic variables are responsible for growth retardation whereas better socio-demographic factors accelerate growth during childhood. Malnutrition is responsible for premature mortality and morbidity during childhood.

Anthropometry is widely used to assess the nutritional condition and anthropometric characteristics of an individual or community as a whole. Anthropometry is a universally applicable, inexpensive and non-invasive tool for the assessment of the human physiology (de Onis and Habicht, 1996), it has reliability and low cost and is accepted globally to determine anthropometric characteristics, physical growth and nutritional assessment of individuals or communities. Anthropometry is widely used for assessment of health and growth patterns during childhood. Poor socio-economic status leads to poor nutrition which influences growth during childhood (de Onis, 2001). Anthropometric measurement tools are mandatory for the type of health-related research during childhood (Rao 1970). Measurement of height and weight are important factors related to growth and development among preschool children (Bener & Kamal, 2005).

WHO and NCHS adopted a new approach to monitor child growth from 2 to 5 years and 0 to 18 years, respectively. The curves are derived from weight for age, height for age, weight for length, body mass index for age, head circumference for age and mid-upper circumference for age, following (WHO) (<https://www.who.int/tools/child-growth-standards/standards>) and (NCHS) / Centers for Disease Control and Prevention (CDC), constructed age-specific percentile values of height, weight and BMI (Hamill, 1977).

Researchers argued for local standards from ecological and genetic backgrounds, which need to be updated with changing socio-economic and demographic factors (Goldstein & Tanner, 1980; Tanner, 1986). There are several national and international studies on anthropometric characteristics reported among children (Oja, 2002; Fredriks et al., 2003; Bose et al., 2005; Bose et al., 2008; Das et al., 2009; Isacco et al., 2010; Khadilkar, 2010; Gandhi et al., 2010; Cadenas-Sánchez et al., 2015; Farkaš et al., 2015; Pal & Bose, 2017; Bjelanović et al., 2017; Grouleffa, 2021; Peulić et al., 2024).

Most of the literatures have focused on anthropometric characteristics of the adolescent and adult population in West Bengal as well as India. There was hardly any study available among preschool children of Jalpaiguri aiming to assess the age and sex variation in anthropometric characters. The present investigation ascertains to analyse the anthropometric characters and physical growth among Bengali preschool children of the Jalpaiguri district of West Bengal. The present study focused on age and sex variation of anthropometric characteristics among preschool

children of Maynaguri. A comparative analysis of height, weight and BMI at the level of 50th percentile done between present, national and international studies.

Materials & methods

The present cross-sectional study was conducted among 607 preschool children (301 boys & 306 girls) aged 2-5 years by purposive stratified random sampling method. 20 ICDS centres have been selected randomly by A.B. (first author) from different villages of Barnesh gram panchayet (rural area), Maynaguri Block, Jalpaiguri district, West Bengal, India. All the study participants belonged to Bengali ethnicity. Permission was obtained from the Child Development Project Officer (CDPO) of the Maynaguri block and parents were informed the purpose of the study before commencing. According to the census of India 2011, the total population of Maynaguri block was 329032, of which, 41633 were children aged under 6 years. The structured questionnaire was utilized for data collection. The date of birth was collected from the polio vaccination card provided by Anganwadi workers and from the mothers.

Anthropometric variables

There are 9 anthropometric measurements were recorded including height, weight, sitting height, arm span, head circumference, chest circumference, mid-upper arm circumference, waist circumference and hip circumference by applying standard technique (Lohman et al. 1988).

Body Mass Index (BMI), Sub ischial Leg Length (SLL), Waist Hip Ratio (WHR) and Head-Chest Ratio (HCR) were derived using the following formula:

BMI (kg/m ²) = Weight (kg)/ Height ² (m)	by Hadžihalilović et al. (2004)
HT (cm) – SH (cm) = SLL (cm)	by Dangour et al. (2001).
WHR= WC (cm)/ HC (cm)	by Singh et al. (1993).
HCR = HC (cm)/ CC (cm)	by Malina et al. (1975).

Statistical analysis

Descriptive statistics like mean and standard deviation were computed to understand the data distribution and variability. t-test was utilised to analyse the significant sex difference in the mean anthropometric characteristics. One-way Anova was used to assess significant sex combined age variation. Age and sex-specific percentile values were also derived from standard statistical procedures. All statistical analysis was performed by using Statistical Package of Social Science (SPSS 18.0) where the significant level was set as p<0.05.

Results

<i>Variable</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Mean</i>	<i>SD</i>
HT (cm)	73.00	117.10	96.34	9.29
WT (kg)	8.00	29.60	13.59	2.77
BMI (kg/m ²)	9.55	22.11	14.56	1.48
AS (cm)	72.00	118.00	95.66	9.30
SH (cm)	43.20	64.40	53.91	4.08
SLL (cm)	28.00	61.40	42.43	5.68
MUAC (cm)	10.40	22.50	14.31	1.27
HDC (cm)	42.30	55.90	47.65	1.79
CC (cm)	40.70	67.50	49.59	3.31
HCR	0.75	1.17	0.963	0.051
WC (cm)	37.20	66.50	47.03	3.74
HC (cm)	39.20	70.00	49.58	4.05
WHR	0.81	1.08	0.949	0.027

Table 1: Descriptive statistics (mean & sd) of the anthropometric variables of the study participants

Table 1 describes the age and sex combined minimum and maximum values, mean and standard deviation values of anthropometric characteristics to highlight the variability and the data distribution of preschool children of Jalpaiguri. The difference of height was 44.10 cm, weight was 21.6 kg, BMI was 12.56 kg/m², Arm Span (AS) was 46 cm, Sitting Height (SH) was 21.2 cm, Sub Ischial leg length (SLL) was 33.40 cm, Mid upper arm circumference (MUAC) was 12.10 cm, Head Circumference (HDC) was 13.60 cm, Chest Circumference (CC) was 26.80 cm, Head Chest Ratio (HCR) was 0.42, Waist Circumference (WC) was 29.30 cm, Hip Circumference (HC) was 30.80 cm, Waist Hip Ratio (WHR) was 0.27 among preschool children.

<i>Variable</i>	<i>Boys (301)</i>	<i>Girls (306)</i>	<i>t – value (df - 605)</i>	<i>p value</i>
Height (cm)	97.22 (9.22)	95.48(9.28)	2.308	0.021
Weight (kg)	13.84 (2.82)	13.34(2.71)	2.252	0.025
BMI (kg/m ²)	14.56 (1.43)	14.56 (1.53)	0.072	0.943
AS (cm)	96.78 (9.23)	94.56 (9.26)	2.948	0.003
Sitting Height (cm)	54.48 (4.1)	53.34 (3.99)	3.476	0.001
SLL (cm)	42.73 (5.57)	42.14 (5.78)	1.285	0.199
HDC (cm)	47.96 (1.70)	46.97 (1.66)	6.871	0.000
CC (cm)	50.30 (3.23)	49.17 (3.33)	3.225	0.001
HCR	0.9648 (.04)	0.9624 (.05)	0.587	0.557
MUAC (cm)	14.34 (1.25)	14.28 (1.29)	0.603	0.547
WC (cm)	47.14 (3.55)	46.92 (3.92)	0.740	0.460

Variable	Boys (301)	Girls (306)	t – value (df - 605)	p value
HC (cm)	49.50 (3.85)	49.66 (4.24)	-0.503	0.615
WHR	0.9530 (.024)	0.9454 (.029)	3.445	0.001

Table 2: Results of t-test of Anthropometric variables between boys and girls.

Table 2 describes the sex-specific mean and standard deviation of anthropometric characteristics. Anthropometric variables of boys were higher than the girls except BMI. Statistically significant sex differences was found in height (t- 2.308, $p<0.021$), weight (t- 2.252, $p<0.025$), arm span (t- 2.948, $p<0.003$), sitting height (t- 3.476, $p<0.001$), head circumference (t- 6.871, $p<0.000$), Chest Circumference (t- 3.225, $p<0.001$) and Waist Hip Ratio (t- 3.445, $p<0.001$).

Variables	Age in years				F-value	p-value
	2 (n=143)	3 (n=155)	4 (n=179)	5 (n=130)		
Height (cm)	85.45 (4.93)	92.40 (4.42)	101.01 (5.40)	106.60 (5.35)	483.628	.000
Weight (kg)	11.13 (1.68)	12.48 (1.45)	14.60 (2.03)	16.22 (2.87)	169.603	.000
BMI (kg/m ²)	15.20 (1.50)	14.60 (1.28)	14.28 (1.37)	14.20 (1.62)	14.372	.000
AS (cm)	84.97 (5.05)	91.77 (4.77)	100.19 (5.39)	105.82 (5.84)	430.221	.000
SH (cm)	49.76 (2.40)	51.98 (2.32)	55.98 (2.82)	57.92 (2.98)	279.913	.000
SLL (cm)	35.65 (3.01)	40.42 (3.02)	45.03 (3.32)	48.68 (3.37)	439.497	.000
HDC (cm)	46.49 (1.62)	47.30 (1.70)	48.01 (1.45)	48.85 (1.62)	54.560	.000
CC (cm)	47.31 (2.35)	48.37 (2.45)	50.59 (2.73)	52.19 (3.48)	88.546	.000
HCR	.984 (.048)	.980 (.049)	.951 (.047)	.939 (.046)	30.383	.000
MUAC (cm)	13.73 (1.21)	14.11 (1.03)	14.52 (1.11)	14.9 (1.49)	24.185	.000
WC (cm)	44.87 (2.56)	45.87 (2.79)	48.11 (3.24)	49.31 (4.59)	52.301	.000
HC (cm)	47.13 (3.1)	48.55 (3.02)	50.84 (3.45)	52.13 (4.66)	59.016	.000
WHR	0.952 (.026)	0.951 (.026)	0.947 (.026)	0.946 (.028)	2.283	.078

Table 3: Age-specific distribution of descriptive statistics and result of one way ANOVA of anthropometric variables

Table 3 represents the age-specific mean and standard deviation of anthropometric characteristics of the study participants. All mean anthropometric characteristics increased with the advancement of age except BMI and WHR from 2 to 5 years. Statistically significant age differences (where $p<0.05$ is statistically significant) was observed in all anthropometric variables except WHR (WHR: $F=2.283$, $p>0.05$). Age-specific highest positive attainment of physical growth was observed in height (8.61 cm) and weight (2.12 cm) in 4-year-old preschool children. BMI is slightly decreasing with the increasing age of the studied sample.

Height (cm)							
AGE (Years)	5 th	10 th	25 th	50 th	75 th	90 th	95 th
2	79.00	80.50	83.00	86.00	89.30	93.44	94.00
3	87.24	88.40	91.20	93.35	96.30	98.32	99.35
4	92.54	94.10	97.67	100.90	105.05	108.02	108.93
5	100.42	101.50	105.6	107.7	110.50	113.50	115.72
Weight (kg)							
AGE (Years)	5 th	10 th	25 th	50 th	75 th	90 th	95 th
2	8.70	9.43	10.33	11.09	12.25	13.07	13.83
3	10.44	10.79	11.83	12.83	13.50	14.01	14.85
4	11.66	12.13	13.51	14.47	15.78	16.41	17.17
5	13.70	14.30	15.00	15.85	17.60	19.81	21.28
BMI (kg/m ²)							
AGE (Years)	5 th	10 th	25 th	50 th	75 th	90 th	95 th
2	13.07	13.28	14.29	14.96	15.92	16.67	17.65
3	12.62	13.18	13.89	14.51	15.25	16.31	17.00
4	12.86	13.13	13.65	14.24	14.71	15.55	15.74
5	12.55	12.81	13.22	13.97	14.79	15.71	17.30

Table 4: Age-wise percentile values of Height, Weight and Body Mass Index among Boys.

Table 4 represents age and sex-specific percentiles of 5th, 10th, 25th, 50th, 75th, 90th and 95th values for height, weight and BMI of boys. In the case of boys anthropometric characteristics viz. HT, WT and BMI tend to increase over age with percentile values raising accordingly.

Height (cm)							
AGE (Years)	5 th	10 th	25 th	50 th	75 th	90 th	95 th
2	76.25	78	81.35	84.9	88.15	89.40	91.40
3	83.68	85	88.70	92.10	95.30	97.16	98.30
4	91.42	94.2	97.30	101.10	105	107.64	109.68
5	99	100	102	105.40	108.50	112.20	113.30
Weight (kg)							
AGE (Years)	5 th	10 th	25 th	50 th	75 th	90 th	95 th
2	8.47	8.90	10	10.80	11.97	13	13.53
3	10.13	10.53	11.50	12.20	13.40	13.90	14.39

4	11.44	12.02	13.20	14.49	15.77	17.04	18.56
5	12.50	13.30	14.30	15.20	16.91	18.70	20.40
BMI (kg/m ²)							
AGE (Years)	5 th	10 th	25 th	50 th	75 th	90 th	95 th
2	13.45	13.84	14.35	14.83	16.01	16.97	17.49
3	12.81	13.12	13.76	14.49	15.28	16.37	16.99
4	12.39	12.89	13.25	14.11	14.88	16.04	16.72
5	12.51	12.78	13.06	13.67	14.77	15.62	16.03

Table 5: Age-wise percentile values of Height, Weight and Body Mass Index among Girls

Table 5 represents the age and sex-specific percentiles of 5th, 10th, 25th, 50th, 75th, 90th and 95th values for height, weight, and BMI of girls. In the case of girls anthropometric characteristics viz. HT, WT and BMI tend to increase over age with percentile values raising accordingly.

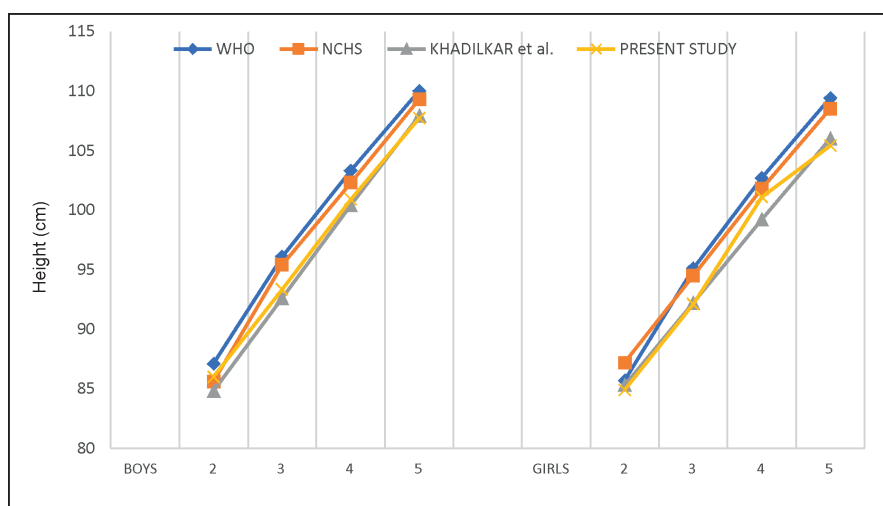

 Figure 1: Comparison of height at the level of 50th percentile of Boys and Girls with other studies

Figure 1 shows that the 50th percentile of height for boys and girls of the present investigation is lower than WHO and NCHS standards in all age groups. The 50th percentile value of height of the present boys was higher than the boys aged 3 and 4 years studied by Khadilkar et al. (2010). On the other hand, the 50th percentile value of height of the present girls was higher than the girls aged 3 years studied by Khadilkar et al. (2010).

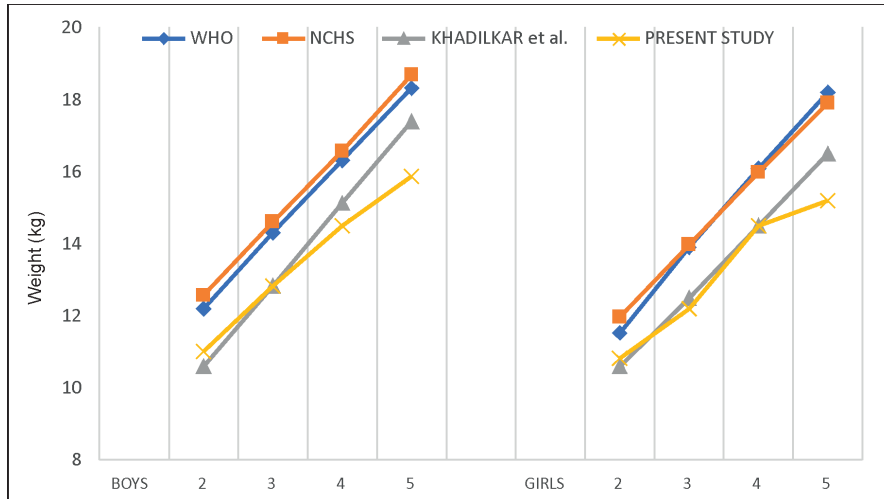


Figure 2: Comparison of Weight at the level of 50th percentile of Boys and Girls with other studies

Figure 2 represents the 50th percentile of weight for boys of the present investigation is lower than WHO and NCHS standards in all age groups both in boys and girls. The 50th percentile value of weight of the present boys was higher than the boys aged 2 and 3 years studied by Khadilkar et al. (2010). On the other hand, the 50th percentile value of weight of the present girls was lower than the girls in all age groups studied by Khadilkar et al. (2010).

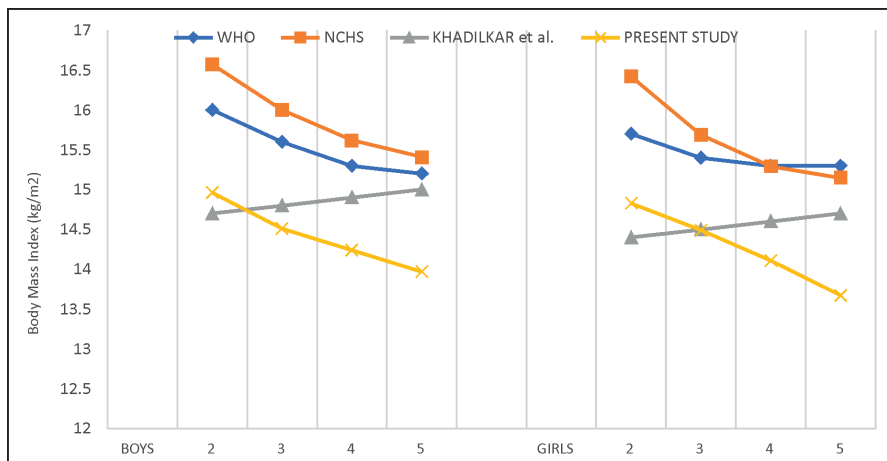


Figure 3: Comparison of BMI at the level of 50th percentile of Boys and Girls with other studies

Figure 3 describes the 50th percentile of BMI for boys and girls of the present investigation was lower than WHO and NCHS standards in all age groups. The 50th percentile value of BMI of the present result was higher than the boys and girls aged 2 years studied by Khadilkar et al. (2010).

Discussion

Preschool children are a vulnerable segment of our society (Das & Bose 2018; Tigga et al. 2018; Sinha et al. 2021). The present study observed that anthropometric characteristics of preschool children increased over age. Overall mean height and weight among boys was higher than girls of the present study. The mean height and weight increased with advancement of age of preschool children of Jalpaiguri district, similar result was found in Bouri preschool children of West Bengal, India (Das & Bose 2009), preschool children of Taiwan (Cheng et al. 2019), Turkish origin children in the Netherland (Fredriks et al. 2003) and preschool children of Croatia (Farkaš et al. 2015), whereas chest circumference and head circumference increased with advancement of age, similar result reported among preschool children of Bulgaria (Mladenova 2021). The percentile curve represents the increasing trend of anthropometric characteristics with the advancement of age except BMI among both sexes. Factors like anthropometric traits and nutrition play a mutual interaction in child growth. Most of the anthropometric characters of the present investigation show increasing trends with age.

The present investigation reported significant sexual dimorphism in height, weight, sitting height, head circumference and Body Mass Index which is similar to a study done on primary school children of Hooghly (Pal & Bose 2017). Significant age variation was found on most of the anthropometric variables such as height, weight, body mass index, sitting height, sub ischial leg length, chest circumference and head circumference similar to the study reported on Bengalee Hindu school girls of Kolkata (Bose et al. 2005) and a recent study reported significant age variation in height, weight, sitting height, mid upper arm circumference, sub ischial leg length among primary school children of Hooghly (Pal & Bose 2017).

The present study compares the age-combined sex-specific mean height preschool children with regional studies. The mean height of the present study (both sexes) was higher than the children of Madhyamgram and Barasat (Bose et al. 2008), Muslim children (Debnath 2020), Hill Korwa children of Chhattisgarh (Das et al. 2020), Bengalee Muslim children (Hoque et al. 2024) and distinctly lower than the Lodha children (Bisai et al. 2008), Santal children (Das and Bose 2011), children of Karnataka (Nayak et al. 2015), Bengalee preschool children (Giri 2018). The mean weight of the present study (both sexes) was higher than the children of Chapra (Bose et al. 2007), Lodha children (Bisai et al. 2008), children of Karnataka (Nayak et al. 2015), Bengalee preschool children (Giri et al. 2018),

Muslim children (Debnath 2020), Hill Korwa children of Chhattisgarh (Das et al. 2020), Rajbanshi children (Biswas and Khatun 2023), Bengalee Muslim children (Hoque et al. 2024) and lower than the Punjabi children (Singh and Grover 2003), Santal children (Das and Bose 2011). The mean BMI of the present study was higher than the children of Karnataka (Nayak et al. 2015), Bengalee preschool children (Giri 2018) tribal children (Mahapatra and Bose 2023) and lower than the Gond girls of Chhattisgarh (Das et al. 2016), Hill Korwa boys of Chhattisgarh (Das et al. 2020). The sex specific mean height, weight and body mass index reported in the previous studies corroborated the present findings. Although the median values of height, weight and body mass index lower than the international reference. The comparison of regional studies provides valuable context to understand age combined physical growth of anthropometric characteristics among preschool children. Different population exhibits distinct growth pattern, present study describes and compares the regional variation in anthropometric characteristics such as height, weight, body mass index. Targeted interventions can be designed to address growth assessment by consideration of sex, age, ethnicity and regional background.

Comparison of median height (cm) with other studies shows that studied boys and girls were shorter than other children studied by WHO (values less by -1.1 cm to -2.75 cm for boys and -0.8 cm to -4 cm for girls) and NCHS (values more or less by +0.4 to -2.05 cm for boys and -0.7 cm to -3.1 cm for girls) whereas more or less similar to the study of Khadilkar et al. 2010 (values more or less by -1.2 cm to +0.75 cm and -0.4 cm to +1.9 cm for girls). A comparative picture of median weight (kg) reveals that the present studied boys and girls were lower than WHO (values less by -1.2 kg to -2.45 kg for boys and -0.7 kg to -3 kg for girls) and NCHS (values less by -1.57 kg to -2.85 kg for boys and -1.17 to -2.7 kg) standards, on the other hand more or less similar to the study done by Khadilkar et al. 2010 (values more or less by +0.4 kg to -1.55 kg for boys and +0.2 kg to -1.3 kg for girls).

The mean sitting height of the studied children (boys and girls both) distinctly higher than Bengalee preschool children (Giri 2018) and tribal children i.e. Santal and Bhumij (Mahapatra 2021). The mean BMI of the present boys and girls has higher value than children of Karnataka (Nayak et al. 2015), Bengalee preschool children (Giri 2018) and Tribal children (Mahapatra and Bose 2023). The mean head circumference of the present boys and girls has higher value than Bengalee preschool children (Giri 2018), Muslim children of Darjeeling (Debnath 2020), tribal children (Santal and Bhumij) of Paschim Medinipur (Mahapatra 2021). The mean chest circumference of the present boys and girls has higher value than Bengalee preschool children (Giri 2018), tribal children (Santal and Bhumij) of Paschim Medinipur (Mahapatra 2021) but lower than children of Punjab (Singh and Grover 2003). The mean mid upper arm circumference of the present boys and girls has

higher value than ICDS children of Delhi (Gupta and Chadha 2017) and Sabar children of Purulia (Mahata et al. 2021) but lower than Bengalee preschool children (Giri 2018), Muslim children (Debnath 2020). The mean waist circumference of the present boys and girls has higher value than Bengalee preschool children (Giri 2018) but lower than preschool children of Purulia (Datta Banik et al. 2016). The mean hip circumference of the present boys and girls has higher value than the preschool children of Purulia (Datta Banik et al. 2016), Bengalee preschool children (Giri 2018). The mean waist hip ratio of the present boys and girls lower than the preschool children of Purulia (Datta Banik et al. 2016).

The present study reveals the significant sexual dimorphism found in height similar the previous studies (Giri et al. 2018, Debnath 2020). Significant sexual dimorphism found in weight similar the previous studies (Das and Bose 2011; Giri et al. 2018; Debnath 2020). Significant sexual dimorphism found in sitting height supporting the previous findings (Giri 2018; Mahapatra 2021). Significant sexual dimorphism found in head circumference similar to previous findings (Giri et al. 2018; Debsarma et al. 2021). Significant sexual dimorphism in WHR not supporting previous study (Datta Banik et al. 2016).

The 50th percentile of height, weight and body mass index of the children (both boys and girls) of studied population had lower values as compared to the 50th percentile of international growth standard like WHO and NCHS. This disparity may be attributed to children from Western standards being comparatively higher than the studied preschool children. Research shows lower centiles in Indian children compared to WHO and NCHS standards (Patel and Unisa 2014) supporting the present report. However, partial overlap was observed in certain age groups when compared with affluent Indian preschool children reported by Khadilkar et al. (2010). Finding reveals from NFHS 4, the Indian synthetic growth reference is more appropriate over WHO standards for evaluating growth and nutritional classification among Indian children (Khadilkar et al. 2021). This result varies due to inadequate intake of nutritious food, food insecurity and poverty in low and middle income countries as well as India (Ramachandran & Gopalan 2011; Black et al. 2013). When the mean anthropometric characteristics compared with Indian studies which is compatible due to similar rural, regional and environmental background. Indian standards should be developed to compares the anthropometric characteristics for validate the reliability of various measures. Similar studies need to be done among preschool children for further research in various community settings.

The present study has its limitation due to cross sectional in nature, small sample size, lack of information about dietary intake, socioeconomic demographic determinants among the study participants.

Conclusion

The present study assessed the age specific change and sex wise variation in anthropometric characteristics of preschool children. We compared the findings with other standards developed by WHO and NCHS. It is found that mean anthropometric characteristics are higher among boys than girls. There are few anthropometric characteristics (i.e. height, weight and BMI) in the present study, which are lower than international standards like WHO and NCHS and more or less comparable with the study done by Khadilkar et al. (2010) because of a similar background. Research on anthropometric characteristics needs to be done on a regional and ethnic basis to ensure accurate standards at the community level. The findings of the present study will help other researchers to understand age trends of anthropometric characters among preschool children which assess the child overall health status and can predict the health risk in adult. Understanding age related trends in height, weight, and body mass index is essential for assessing normal growth patterns and to address the growth faltering during childhood. ~~[what are the benefits/importance of knowing this age trend? Add note]~~. Appropriate nutritional intervention programs and planning in public health are needed to achieve the full-fledged growth potential among preschool children of the studied population.

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Conflict of Interest

There is no conflict of interest

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