



COMPARATIVE STUDY THE ANTHROPOMETRIC STATUS BETWEEN SANTAL AND GENERAL PRE-SCHOOL (1-5 YEARS) GIRLS

Subhashis Sasmal¹ and Sankar Kumar Dey^{2*}

¹Department of Food and Nutrition, CMJ University, Meghalaya, India.

²Department of Physiology, SBSS Mahavidyalaya, West Bengal, India.

Corresponding Author: Sankar Kumar Dey

Department of Physiology, SBSS Mahavidyalaya, West Bengal, India.

Article Received on 09/12/2022

Article Revised on 29/12/2022

Article Accepted on 19/01/2023

ABSTRACT

Developing country like India accounts for about 40% undernourished children in the world. It is well documented that chronic undernutrition is associated with slower cognitive development and serious health impairment later in life which reduces the quality of life in children. So the present study suggests the anthropometric status like height, weight, head circumference, chest circumference and mid upper arm circumference between Santal and General Pre-school (1-5 years) girls. The sample for present cross sectional study, the santal and general girls having age range between 1-5 years was selected randomly from different villages of Paschim Medinipur, Purba Medinipur and Bankura districts of West Bengal, India. Results showed that mean height and weight gradually increased with increasing age of both Santal girls and general girls and there is a highly statistical significant difference has been observed in all anthropometric parameters in all studied age group of children. Height in age group one year, height and head circumference in age group four year, there is no statistical differences have been occurred. It may be concluded that santal pre-school children have poor nutritional status compare with general pre-school children. So need to appropriate steps to improve the nutritional status of santal children.

KEYWORDS: Girls; Tribal, General, Anthropometric Status.

INTRODUCTION

In India, indigenous population is also known as Adivasi or Schedule Tribes (ST). The tribal population of India (84 million) is larger than that of any other country in the world (Census of India, 2011). In West Bengal, Santal represents 51.8% of total tribal population and the other major tribes are Asur, Birhor, Korwa, Lepcha and Munda (Census of India, 2001) and they are spread over in vast area of different district of Paschim Medinipur, Purba Medinipur, Bankura and Purullia.

Undernutrition is defined as insufficient energy intake and nutrients to meet an individual's dietary requirements and maintain good health (Meleta, 2006). It encompasses underweight, stunting, wasting and deficient in micronutrients (UNICEF, 2006). Undernutrition commonly affects all age groups in a community, infants and children are the most susceptible because of their high nutritional needs for their physical growth and development (Blossner and De Onis, 2005) and also mental development (Ghai et al, 2009). It is more prominent where people are experiencing rapid food insecurity and poverty in developing countries like India. In India, one third of malnourished children resides. The majority of malnourished children are belonging to lower

socioeconomic level. Tribal communities in India are thought about to be socially and economically vulnerable community (Bisai et al, 2014). According to World Health Organization, it has been found that around 45% deaths of children below five years are connected with undernutrition. Malnutrition is a global burden and it is serious and lasting for individual and their families, for communities and for countries (WHO, 2021). Malnutrition is a major public health problem leading to child morbidity and underlying cause for more than half of child deaths worldwide, particularly in low socio-economic communities in developing countries (Schroeder and Brown, 1994, Pellitier et al 1994). So the present study suggests the anthropometric status between Santal and General Pre-school (1-5 years) girls.

MATERIALS AND METHODS

Subject selection

The sample for present cross sectional study, the santal and general girls having age range between 1-5 years was selected randomly from different villages of Paschim Medinipur, Purba Medinipur and Bankura districts of West Bengal, India.

Study of nutritional status and prevalence of undernutrition

The nutritional status of randomly selected santal children of study areas was assessed by anthropometric measurements e.g., height, weight, head circumference, chest circumference and mid upper arm circumference by following standard techniques (WHO, 1995), the details of which are given below

(a) Measurement of height

The children under two years of age measured the horizontal length. In such cases, children length was measured by lying down. Infantometer was used to measure the horizontal length. The children lies straight along the board and shoulders of children should touch the board at supine position. Older children or two years aged children who are able to stand was measured by using anthropometric rod and the reading was taken to the nearest 0.1 cm.

(b) Measurement of Weight

Weight of old children was measured by using portable weighing machine with wearing minimum cloth. During measuring weight, children should be stand motionless in the middle of the scale platform. Weight should be evenly distributed both feet, with feet slightly apart arm relaxed and having down loosely at the side of the body. The body weight of the children under two years was measured by using lever balance. The recording was taken to the nearest 0.5 kg.

(c) Head circumference

A still tape was used to measure head circumference of the children. Measuring tape should be scaled to 0.1 cm. The tape should be placed superior to the supraorbital ridge and adjusted around the head until the maximum circumference was obtained. The plane of tape should be identical on both sides of the head and care should be taken that the tape is set down evenly flat against the head. The tape should be relaxed and two more measurements obtained and mean taken down. Hair pins and band should be removed before measuring.

(d) Mid Upper Arm Circumference

A still tape was used to measure mid upper arm circumference. All measurements should be taken in triplicate to the nearest 0.1 cm. Mid Upper Arm Circumference was taken at the midpoint of the upper arm. The midpoint was calculated by measuring the length of the upper arm and also point out the midpoint. The mid upper arm circumference was measured with the children upright and arm down in a fully relaxed position. The measurement is taken at the midpoint with the tape measure perpendicular to the long axis of the arm. Precaution should be taken so that there is no pinching or gaping of the tape as it encircles the arm.

(e) Chest Circumference

A Still tape was used to measure chest circumference. During starting of measuring whilst the children was

standing, feel for the xiphisternum where the ribs meet the sternum and mark with a short horizontal line. Then pass the tape around so that the mark is at the upper border of the tape and make sure the tape is level. It should relaxed on the skin but not pulled too tight and taken the reading at the end of the measurement. Measurement should be taken to the nearest 0.1 cm. The measurement repeated three times and calculates mean value.

Statistical Analysis

The data were expressed as mean \pm S.E.M. Comparisons of the means between two groups were made by student-*t* test and assess a limit of significance.

RESULTS

Table 1, 2, 3, 4 & 5 showed that the changes of anthropometric parameters (Height, Weight, Head circumference, Chest circumference and Mid Upper Arm Circumference) of Santal girls and general girls in one to five years children. It was found that mean height and weight gradually increased with increasing age of both Santal girls and general girls and there is a highly statistical significant difference has been observed in all anthropometric parameters in all studied age group of children. Height in age group one year, height and head circumference in age group four year, there is no statistical differences have been occurred.

Table 1: Comparison of Anthropometric Parameters between Santal and General Pre-school (One Year) Girls.

Age (Years) One	Anthropometric Variables	Santal Girls				General Girls				T-test
		N	Mean	SD	SEM	N	Mean	SD	SEM	
	Height(cm)	22	68.99	10.83	2.31	17	73.16	6.50	1.58	1.4019 P<0.1693
	Weight(Kg)	22	6.09	0.95	0.20	17	9.24	2.06	0.50	6.3699 P<0.0001
	Head circumference(cm)	22	42.38	2.76	0.59	17	47.24	1.90	0.46	6.2064 P<0.0001
	Chest circumference(cm)	22	40.73	2.17	0.46	17	48.38	2.22	0.54	10.8137 P<0.0001
	MUAC(cm)	22	11.98	0.91	0.19	17	15.15	1.25	0.30	9.1966 P<0.0001

Table 2: Comparison of Anthropometric Parameters between santal and general Pre-school (Two Year) Girls.

Age (Years) Two	Anthropometric Variables	Santal Girls				General Girls				T-test
		N	Mean	SD	SEM	N	Mean	SD	SEM	
	Height(cm)	19	75.33	5.53	1.27	30	81.39	8.58	1.57	2.7331 P<0.0088
	Weight(Kg)	19	8.45	1.96	0.45	30	10.68	1.73	0.31	4.1772 P<0.0001
	Head circumference(cm)	19	43.97	2.16	0.50	30	46.10	2.49	0.46	3.0593 P<0.0037
	Chest circumference(cm)	19	43.79	2.13	0.49	30	47.33	2.91	0.53	4.5771 P<0.0001
	MUAC(cm)	19	12.66	1.12	0.26	30	15.80	0.76	0.14	11.7226 P<0.0001

Table 3: Comparison of Anthropometric Parameters between santal and general Pre-school (Three Year) Girls.

Age Three	Anthropometric Variables	Santal Girls				General Girls				T-test
		N	Mean	SD	SEM	N	Mean	SD	SEM	
	Height(cm)	29	81.51	5.5490	1.0304	28	87.25	11.91	2.25	2.3456 P<0.0226
	Weight(Kg)	29	9.51	1.210	0.22	28	11.91	2.73	0.52	4.3218 P<0.0001
	Head circumference(cm)	29	45.63	2.38	0.44	28	47.80	1.49	0.28	4.1132 P<0.0001
	Chest circumference(cm)	29	46.06	2.28	0.42	28	47.86	2.41	0.46	2.8937 P<0.0054
	MUAC(cm)	29	13.11	0.89	0.17	28	15.55	1.83	0.35	6.4361 P<0.0001

Table 4: Comparison of Anthropometric Parameters between santal and general Pre-school (Four Year) Girls.

Age Four	Anthropometric Variables	Santal Girls				General Girls				T-test
		N	Mean	SD	SEM	N	Mean	SD	SEM	
	Height(cm)	91	95	6.0437	0.6336	44	94.57	5.28	2.30	0.3995 P<0.6902
	Weight(Kg)	91	13.01	1.56	0.16	44	14.20	2.85	0.43	3.1347 P<0.0021
	Head circumference(cm)	91	48.03	1.93	0.20	44	47.88	1.22	0.18	0.4711 P<0.6384
	Chest circumference(cm)	91	49.59	2.11	0.22	44	48.57	2.51	0.38	2.4850 P<0.01421
	MUAC(cm)	91	14.03	0.87	0.09	44	15.50	1.40	0.21	7.4975 P<0.0001

Table 5: Comparison of Anthropometric Parameters between santal and general Pre-school (Five Year) Girls.

Age Five	Anthropometric Variables	Santal Girls				General Girls				T-test
		N	Mean	SD	SEM	N	Mean	SD	SEM	
	Height(cm)	45	98.29	5.66	0.84	80	108.11	8.35	0.93	7.0314 P<0.0001
	Weight(Kg)	45	12.36	1.51	0.22	80	18.61	3.53	0.39	11.2894 P<0.0001
	Head circumference (cm)	45	46.22	2.49	0.37	80	49.24	1.30	0.15	8.9245 P<0.0001
	Chest circumference (cm)	45	48.49	2.01	0.30	80	52.74	3.21	0.36	8.0265 P<0.0001
	MUAC(cm)	45	13.78	1.13	0.17	80	16.98	1.75	0.20	11.0456 P<0.0001

DISCUSSION

The progress of malnutrition in India is also limited although India has largest child development programme in the World (Chatterjee, 2007). Undernutrition take part a significant role in mortality of children under five

years. About 50% of all deaths among children are connected with undernutrition (Rice et al, 2000).

Present study suggests the anthropometric parameters like mean height, weight, head circumference, chest

circumference and mid upper arm circumference (Table-1, 2, 3, 4 & 5) between santal and general pre-school girls. It appears from the present study that mean height and weight was gradually increased with increasing age in santal children and there is no statistical significant difference has been occurred between the Santal girls in one to five years children except age group four and five years. Here it was also found that there is statistical significant difference has been occurred in weight and mid upper arm circumference among girls in age group four years and highly statistical significant difference has been observed in head and chest circumference of santal girls in age group five years. The study focussed that mean height, weight, head circumference, chest circumference and mid upper arm circumference below the normal standard (WHO, 2006) in santal pre-school children of both sexes. A study on reported that mean height and weight of pre-school santal children was higher than present study (Das et al, 2010; Mahapatra and Pal, 2020). Rao et al reported that mean height and weight of tribal pre-school children was lower than the present study (Rao et al, 2005).

On the basis of result and discussion, it may be concluded that santal pre-school children have poor nutritional status compare with general pre-school children. Santal girls (1 – 5 Years) are more prone to have undernutrition in terms of underweight, stunting and wasting compare with the general pre-school girls (1 – 5 Years). Higher rate of underweight, stunting and wasting was observed in santal pre-school children, indicating the censorious condition. So need to appropriate steps to improve the nutritional status of santal children.

REFERENCES

1. Bisai S. Prevalence of undernutrition among santal tribal preschool children of Paschim Medinipur District, West Bengal, India. *International Journal of Pediatrics*, 2014; 2(4 – 3): 347 - 354.
2. Blossner M, De Onis M Malnutrition. Quantifying the health impact at national and local levels. Geneva, World Health Organization. WHO Environmental Burden of Disease series, 2005; 12.
3. Census of India Final population, Registrar General and Census Commissioner of India, New Delhi, 2001.
4. Census of India Final population, Registrar General and Census Commissioner of India, New Delhi, 2011.
5. Chatterjee P Child malnutrition rises in India despite economic boom. *Lancet*, 2007; 369: 1417 – 8.
6. Das NK, Glumar AF, Sarma IBR Nutritional Status of the Rabha Tribal Children of Udalguri District of Assam, India. *European Journal of Molecular and Clinical Medicine*, ISSN: 2515 – 8260, 2020; 7.
7. Ghai OP, Paul VK and Bagga A. Ghai Essential Pediatrics, 7th ed. CBS publishers and distributors, New Delhi, India, 2009.
8. Mahapatra B, Pal S. Undernutrition using Anthropometric Indices among the Bhumij preschool children of West Bengal, India. *International Journal of statistical Sciences*, 2020; 20(1).
9. Maleta, K. Undernutrition. *Malawi Medical Journal: The Journal of Medical Association of Malawi*, 2006; 18(4): 189 – 205.
10. Pellitier DL The relationship between child anthropometry and mortality in developing countries: implications for policy, Programs and future research, *Journal of Nutrition*, 1994; 124(10): 2047S- 2081S.
11. Rao VG, Yadav R, Dolla CK Undernutrition and childhood morbidities among tribal preschool children. *Indian Journal of Medical Research*, 2005; 122: 43-7.
12. Rice AL, Saeco L, Hyder A, Black RE Malnutrition as an Underlying Causes of childhood death associated with infectious diseases in developing countries. *Bulletin of the World Health Organization*, 2000; 78(10): 1207 – 1221.
13. Schroeder DG, Brown KH Nutritional status as a predictor of child survival: Summarizing the association and qualifying its global impact. *Bull WHO*, 1994; 72: 569 – 79.
14. UNICEF Policy and programme work on international migration and development by the United Nations Children's Fund, 2006.
15. WHO The World Health fact sheets report on malnutrition, Report of the Director General, 2021.
16. WHO Multicentre Growth Reference Study Group WHO child growth standard: Length/ Height for age, Weight for age, Weight for length, Weight for Height and body mass index for age: method and development. Geneva: World Health Organization, 2006.
17. World Health Organization Physical Status The Use and Interpretation of Anthropometry, WHO technical report No 854, Geneva, WHO, 1995.