



Research Article

ASSESSMENT OF NUTRITIONAL STATUS OF TRIBAL SCHOOL GOING CHILDREN OF SABARKANTHA DISTRICT, GUJARAT

DAVE P. H.¹, MISTRY J.J.² AND CHAUDHARY M.K.³

^{1,2}Department of Food Science & Nutrition, ASPEE College of Home Science & Nutrition, S.D.A.U., Sardarkrushinagar, 385506, India

³Directorates of Extension Education, Sardarkrushinagar Dantiwada Agricultural University, Sardarkrushinagar, Banaskantha, 385506, Gujarat, India

*Corresponding Author: Email-preetidietcare@gmail.com

Received: August 01, 2016; Revised: August 06, 2016; Accepted: August 07, 2016; Published: October 27, 2016

Abstract- Tribal seems to be most exploited, neglected and highly vulnerable to diseases with high degree of malnutrition, morbidity and mortality. Nutrition and health are the most important contributory factors for human resource development in the India. In 2006, the Ministry of Government of India named Sabarkantha is one of the 250 most backward districts. Hence, a need was felt to assess nutritional status of tribal school going children by anthropometric measurements. Total 120 children were randomly selected from two tribal taluka of Sabarkantha district. Various anthropometric measurements were taken and were compared with ICMR and WHO standards. It was observed that children were coming from lower socio-economic condition. Mean height and weight of the children were significantly lower as compared to ICMR standards. As per water low's classification, more than half of the children were suffering from varying degree of malnutrition especially marginal and moderate malnutrition. Very low weight for height was found in the children, which indicated high level of thinness (wasting) amongst the children.

Keywords- Nutritional status, Tribal school going children

Citation: Dave P. H., et al., (2016) Assessment of Nutritional Status of Tribal School Going Children of Sabarkantha District, Gujarat. International Journal of Agriculture Sciences, ISSN: 0975-3710 & E-ISSN: 0975-9107, Volume 8, Issue 51, pp.-2308-2311.

Copyright: Copyright©2016 Dave P. H., et al., This is an open-access article distributed under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution and reproduction in any medium, provided the original author and source are credited.

Academic Editor / Reviewer: Dr H. U. Vyas

Introduction

Tribal are also known as Tribes. Tribal are considered as indigenous inhabitants of the land. A tribe is viewed, historically or developmentally, as a distinct social group existing before the development of states. A tribe is a group of distinct people. Tribes are found to be self sufficient people who largely depend on their land for livelihood and not integrated into the national society. More than half of the world's tribal live in India. Around 698 communities are identified as members of Scheduled Tribes (ST) in India [1] constituting 8.20 percent of the total Indian population [2].

Tribal seems to be most exploited and ignored people and hence are more vulnerable to malnutrition, disease and disorders, morbidity and mortality. Their despair is due to illiteracy, poverty, unawareness wide spread diseases, hostile environment, poor sanitation, lack of safe drinking water and blind beliefs etc.[3]. Health is an important aspect of development and the nutritional status is considered to be one of the indicators for community health as malnutrition has emerged as a major health problem of many tribal groups [4].

The physical growth of children is reflected by different anthropometric measurements, mainly by height and weight. The anthropometric parameters and physique are much influenced by nutrition in growing period of school age. Malnutrition and poor health negatively affects growth and cognitive functions in children. This is the age of dynamic period of growth and development in which children undergo physical, mental, emotional and social changes. Hence, assessment of nutritional status of this age group found necessary [5]. Anthropometric measurements are the most common tool used to assess the nutritional status of a population and to monitor growth in children [6]. According to WHO (1995) anthropometry can be used to verify the existence of a nutritional problem in a population and to assess the magnitude. It provides an indication of

risks as well as that of socioeconomic development. Anthropometry is widely used, easy and low cost method popularly used for assessment health and nutritional status of children [7]. In 2006, the Ministry of Panchayati Raj considered Sabarkantha as one of the country's 250 most backward districts (out of a total of 640). Six districts of Gujarat are receiving funds from the Backward Regions Grant Fund Programme (BRGF) and Sabarkantha is one of them [8]. Hence, a need was felt to assess nutritional status of tribal school going children by anthropometric measurements in Sabarkantha district of Gujarat state.

Materials and Methods

Study population and area

The present study was conducted in Sabarkantha district of Gujarat state of India. The Sabarkantha district has three tribal talukas viz. Khedbrahma, Poshina and Vijaynagar. Khedbrahma and Poshina taluka have low literacy rate. Thus, these two talukas were selected purposively for study. Three villages from both the selected talukas i.e. Navamota, Kheroj and Ratanpur from Khedbrahma and Kotada, Veera falo and Kala Khetra from Poshinataluka were selected randomly. Total six villages were selected for the study. One primary school from each village was randomly selected. From each primary school, the 4th and 5th standard students were selected. From each class of 4th and 5th standard, five boys and five girls were randomly selected. Thus from each primary school ten boys and ten girls were randomly selected. Total 120 tribal school going children were selected for the present study.

Anthropometric Measurements

An electronic weighing scale was used to measure the weight in kilograms. The scale was calibrated. Zero error of score was checked. The children were weighed

with light clothing and without shoes. The weighing machine was placed on a firm and flat ground. Height was measured by using stadiometer. Standing height was measured (to 0.5 cm) without shoes in a erect and straight standing position. Body mass index (BMI) was calculated using anthropometric measurement (height and weight).

Background information

A structured interview schedule was used to assess the socio economic status of the families of school going children [9].

Assessment of nutritional status

Assessment of nutritional status was done by anthropometry using standard methods as per WHO growth standards 2007 [10]. The classification of children in different grades of nutritional status was also done with the help of WHO growth standards 2007 [10].

For assessing the nutritional status of subjects, weight for age and height for age were calculated. The classification for weight for age, height for age, weight for height was followed as per the classification given by Water low et al. (1972) [11] and respondents were categorized as severe, moderate and mild to normal under nutrition. The height and weight measurements were compared with ICMR standard.

Using World Health Organization (WHO) standards [10], nutritional indices i.e. weight for age z score (WAZ) and height for age z score (HAZ) were calculated.

Statistical analysis

Using SPSS windows version 19.0, statistical analysis was to calculate frequency, per cent, mean, standard deviation and t test.

Results and Discussion

Socio-economic profile

[Table-1] shows background information of the respondents and their family, which shows that most of the respondents (99.20%) were Hindu. Total 53.30 per cent respondents were coming from medium size of family. Nearly equal number of respondent's families had joint and nuclear family. Majority (60.80 %) of respondent's families had five or more than five children. More than half of the families (56.70%), were residing in kachcha house. A study conducted in Chikhli taluka of Gujarat, also reported that 88.20 per cent tribal children were Hindu while 11.40 percent tribal children were Muslim. Total 60.60 percent tribal families of Chikhli taluka of Gujarat were residing in semi pakka houses [12].

Table-1 Background information of the respondents and their family

Sr. No.	Social Attributes		n = 120	
			Frequency	Per cent
1.	Religion	Hindu	119	99.20
		Muslim	01	0.80
		Christian	00	00.00
2.	Type of family	Joint family	58	48.30
		Nuclear family	62	51.70
3.	Size of family	Small family (1-4 members)	10	08.30
		Medium family (4-8members)	64	53.30
		Large family (> 8 members)	46	38.30
4.	No. of children in family	1	02	01.70
		2	11	09.20
		3	22	18.30
		4	12	10.00
		5	14	11.70
		6	19	15.80
		>6	40	33.30
5.	Type of house	Kachcha house	68	56.70
		Pakka house	52	43.30

[Table-2] shows that 40.80 percent of respondents' father them were illiterate while 52.50 percent were educated up to higher secondary. Large numbers of families of the respondents (73.30 %) were engaged in farming and animal husbandry. The families coming under the low income group constitutes 63.30 per cent while that of medium income group constitutes 34.20 per cent.

Anthropometric measurements

Water low's classification (1972) is very commonly used for the anthropometric studies and same is adopted for the present study. For classifying individuals as malnourished or as 'at risk' usually, height and weight are classified as under:

1. Weight for Age
2. Weight for Height
3. Height for Age

Table-2 Father's education, family occupation and family income of the respondents

Sr. No.			n = 120	
			Frequency	Per cent
1.	Father's education	Illiterate	49	40.80
		Primary education	18	15.00
		Secondary education	25	20.80
		Higher secondary	20	16.70
		Under graduate	07	05.80
		Post graduates	01	01.20
2.	Family occupation	Farming	14	11.70
		Farming+ animal husbandry	88	73.30
		Farming+ farm laborer	05	04.20
		Farming + business	02	01.70
		Farming + services	11	09.20
		Only service	14	11.70
3.	Family income	Low (up to Rs. 30,000)	76	63.30
		Medium (30,000 to 60,000)	41	34.20
		High (> 60,000)	03	02.50

Table-3 Anthropometric measurements of respondents and its comparison with ICMR standards

Sr. No.	Anthropometric measurements	Girls (30)	Boys (30)
Respondents from standard 4th			
1.	Height (cm)	124.70±8.07	124.40±6.21
	ICMR Standard	132.20	132.20
	Difference	-7.50	-7.80
	't' value	5.093**	6.886**
2.	Weight (Kg)	21.67±3.81	21.56±3.18
	ICMR Standard	28.50	28.10
	Difference	-6.83	-6.54
	't' value	9.813**	11.250**
Respondents from standard 5th			
1.	Height (cm)	130.50±1.38	130.80±2.12
	ICMR Standard	138.30	137.50
	Difference	-7.71	-6.71
	't' value	7.504**	6.705**
2.	Weight (Kg)	24.50±2.55	24.22±1.91
	ICMR Standard	32.50	31.40
	Difference	-8.00	-7.18
	't' value	10.907**	16.212**

**Values shown in table are significant at p<0.01

Data presented in [Table-3] depicts anthropometric measurements of the respondents. Both the groups (girls and boys) showed almost similar values for mean height and weight. The data very clearly shows that both girls and boys were found having considerably lower mean values for height and weight as compared to the ICMR standards. This indicated poor nutritional status and prevalence of malnutrition amongst the tribal children of both the gender.

Similar results were observed in tribal children (age group of 2 to 13 years) in Paschim Medinipur District of West Bengal where only 31.90 per cent children were found having normal weight while thinness was recorded in 67.20 per cent children [7]. The problems of low standard of living, hunger, starvation, malnutrition, agricultural illiteracy, disease, poor sanitary and housing facilities are common to tribal people in comparison to the non-tribal [13]. WHO standards (2007) classify the children into various grades of nutritional status. In a study conducted on tribal children of Chikhli taluka of Gujarat, according to WHO standards (2007), a high prevalence of under nutrition was observed among children below 3 years. Out of the total children, investigated 51.90 per cent were

moderate to severely underweight, 54.70 percent were stunted and 27.10 were wasted [12].

Weight for age

Weight for age is commonly used indicator of body size and it reflects the level of food intake. The relative change of weight with age is more rapid than that of height and is much more sensitive to changes in the growth pattern of the individual. Weight for age is indicator of short-term malnutrition. The low weight for age is called underweight.

National Nutrition Monitoring Bureau carried out a survey on diet and nutritional status of tribal population in the year 2009 and reported that the overall prevalence of thinness among 5-9 year children was about 37.00 percent, with 10.00 per cent having severe thinness and 27.00 per cent having moderate thinness. The overall prevalence of thinness was highest in the State of Maharashtra (about 55 %) followed by 40-46.00 percent in the States of Karnataka, Gujarat and Tamil Nadu, 25-35.00 percent in Andhra Pradesh, Kerala, Orissa and West Bengal, with lowest of 23.30 per cent in Madhya Pradesh [14]. [Fig-1] and [Fig-2] shows the z-scores for WHO standard growth chart for the children aged 5 to 10 years. In both the charts ICMR standard height and weight are showed by a dot while obtained mean values for height and weight of the tribal school going children is showed by dot in rectangle. From both the figures it can be very clearly seen that results obtained in the study are much lower than the standard.

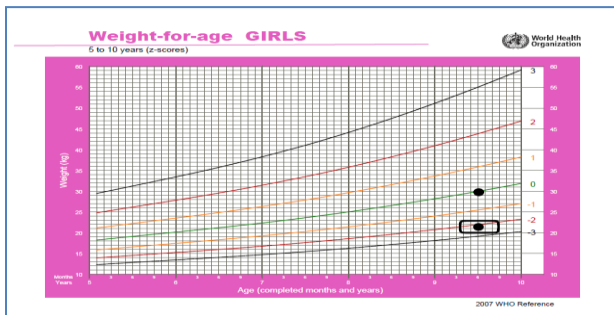


Fig-1 WHO growth chart showing Z-score of weight for age for girls

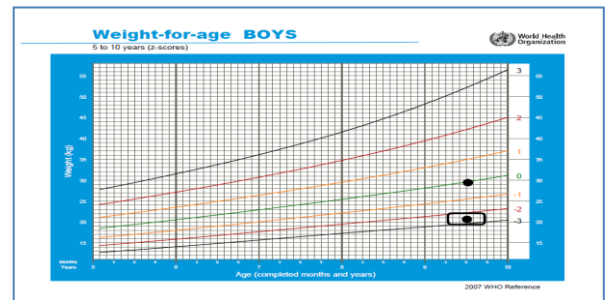


Fig-2 WHO growth chart showing Z-score of weight for age for boys

Height for Age

Length or height is a very reliable measure that reflects the total increase in size of the individual up to the moment it is determined. Low height for age is indicative of stunting and of chronic malnutrition of long-term malnutrition.

[Table-4] depicts the data regarding type of malnutrition prevailing amongst the tribal school going children. It can be observed that there was no considerable difference in malnutrition amongst the girls and boys. More than half of the children were suffering from varying degree of malnutrition especially marginal and moderate malnutrition. Similar results were observed by other researchers that 88.00 and 85.70 per cent of scheduled caste and scheduled tribe communities were suffering from under nutrition as compared to other communities (74.70 %) [15].

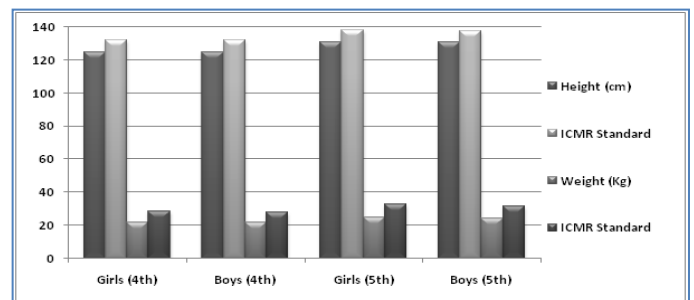


Fig-3 Water low's Classification for nutritional status using height for age

Table-4 Water low's classification for nutritional status using height for age

Sr. No.	Nutritional grade	Girls (30)		Boys (30)		Total	
		Frequency	Per cent	Frequency	Per cent	Frequency	Per cent
	Respondents from 4 th standards						
1	Normal	12	40.00	11	36.70	23	38.33
2	Marginal malnutrition	13	43.30	15	50.00	28	46.66
3	Moderate malnutrition	04	13.30	03	10.00	07	11.66
4	Severe malnutrition	01	03.30	01	03.30	02	3.33
	Respondents form 5 th standard						
1	Normal	15	50.00	17	56.70	32	53.33
2	Marginal malnutrition	11	36.70	10	33.30	21	35.00
3	Moderate malnutrition	04	13.30	02	06.70	06	10.00
4	Severe malnutrition	00	0.00	01	03.30	01	01.66

Weight for Height

The child's degree of thinness can be obtained by relating weight of a child to its height or length. Weight for height basically is a very good index for short duration malnutrition. A too low weight for height is called wasting.

From the [Table-4] and [Fig-5], it can be seen that large number of children in both groups were suffering from moderate to severe malnutrition. This shows high prevalence of thinness (wasting) amongst the children.

Many studies were conducted to see the nutritional status of tribal children in different parts of India in which it was commonly observed that nutritional status of tribal school children was low. Maurya and Jaya reported similar poor conditions from multiple tribal children in Bihar [16]. Tribe specific studies also revealed undernourished conditions among Oraon, Santal and Munda communities in Bihar [17].

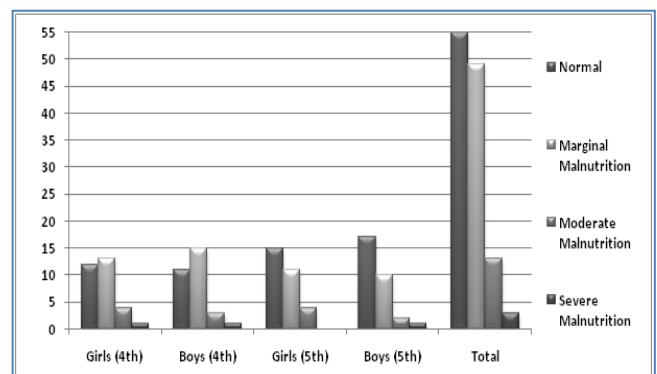


Fig-4 Water low's Classification for nutritional status using weight for height

Das and Bose (2011) reported that prevalence of stunted, wasted and underweight among the Santal tribal children of Midnapore in West Bengal observed 26.30 per cent, 12.70 per cent and 38.20 per cent respectively [18].

Amongst the tribal preschool children of Telangana and Andhra Pradesh, the average daily consumption of dietary constituents (g/CU/day) at household level, was lower than the recommended dietary intakes (RDI) [19].

Table-5 Water low's classification for nutritional status using weight for height

Sr. No.	Nutritional grade	Girls (30)		Boys (30)		Total	
		Frequency	Per cent	Frequency	Per cent	Frequency	Per cent
	Respondents from 4 th standards						
1	Normal	02	06.70	03	10.00	05	08.33
2	Marginal malnutrition	01	03.30	03	10.00	04	06.66
3	Moderate malnutrition	08	26.70	08	26.70	16	26.66
4	Severe malnutrition	19	63.30	16	53.30	35	58.33
	Respondents from 5 th standards						
1	Normal	04	13.30	00	00.00	04	06.66
2	Marginal malnutrition	02	06.70	05	16.70	07	11.66
3	Moderate malnutrition	07	23.30	11	36.70	18	30.00
4	Severe malnutrition	17	56.70	14	46.70	31	51.66

Conclusion

Tribal school going children were coming from lower socio-economic condition. Mean height and weight of the tribal school going children were lower as compared to ICMR standards. As per water low's classification, more than half of the tribal school going children were suffering from varying degree of malnutrition especially marginal and moderate malnutrition. Very low weight for height was found in the tribal school going children which indicates high level of thinness (wasting) amongst the children.

Conflict of Interest: None declared

References

- [1] Indian Ministry of Tribal Affairs (2004) The National Tribal Policy (draft), New Delhi, India ministry of Tribal Affairs.
- [2] Agrawal S. (2013) *Journal of Community Nutrition and Health*, 2(1), 3:14.
- [3] Balgir R.S. (2010) *Online Journal of Health and Allied Sciences*, 9 (4), 275-289.
- [4] Rao H.D. and Satyanarayana K. (1987) *Nutrition Society of India*, 33, 1-6.
- [5] Bharati P., Itagi S. and Megeri S.N. (2005) *Journal of Human Ecology*, 18(3), 177-179.
- [6] Gorstein J., Sullivan K., Yip R de Onis, M., Trowbridge F., Fajans P. and Clugston G. (1994) *Bulletin of World Health Organization*, 72(2), 273-283.
- [7] Bisai S. (2010) *Serbian Journal of Experimental and Clinical Research*, 11(4), 141-145.
- [8] Ministry of Panchayati Raj (September 8, 2009). "A Note on the Backward Regions Grant Fund Programme" (PDF). National Institute of Rural Development. Retrieved September 27, 2011.
- [9] Aggarwal O.P., Bhasin S.K., Sharma A.K., Chhabra P., Aggarwa K., Rajoura O.P. (2005) *Indian Journal of Community Medicine*, 30(4).
- [10] World Health Organization (WHO) (2007) Child Growth Standards. Geneva: WHO.
- [11] Waterlow J.C. (1972) *British Medical Journal*, 3, 566-569.
- [12] Seksaria S.A. and Sheth M.K. (2013) *Paripex - Indian Journal of Research*, 2(12), 97-99
- [13] Vasudevachary A.K. (2006) *Journal of Rural Development*, 54, 33- 36.
- [14] National Nutrition Monitoring Bureau (2009) Diet and Nutritional Status of Tribal Population and Prevalence of Hypertension among Adults, NNMB Technical Report No. 25, Report on Second Repeat Survey National Institute of Nutrition Indian Council of Medical Research Hyderabad, India.
- [15] Singh and Ranjana (1989) *Study on Ethno Medicine*, 4(1), 21-36.
- [16] Maurya S.P., Jaya N. (1997) *Indian Journal of Nutritional Dietetics*, 34, 214 - 20.
- [17] Rao T.V.R.K. and Vijay T. (2006) *Indian Pediatrics*, 43, 181 - 2.
- [18] Das S. and Bose K. (2011) *Journal of Life Science*, 3(2), 81-85.
- [19] Rao K.M., Balakrishna N., Laxmaiah A., Venkaiah K., Brahman, G.N.V. (2006) *Asia Pacific Journal of Clinical Nutrition*, 15(1), 64-7.