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Explorations in Indian Medical Anthropology

Essays in Honour of Professor R.K. Mutatkar

Volume 2
Disease, Health and Culture

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Foreword

I am happy to write this foreword to these two volumes brought out by the Society for Indian Medical Anthropology. Contents indicate that these would be a welcome addition to medical anthropology with special focus on public health knowledge in India. India has made great strides in upgrading the clinical science and technology with a clear significant impact on longevity and other health indices. However, the fruits of new knowledge and improvements in infrastructure have not desirable impact on masses living in difficult to reach geographical settings and social milieu. Government of India is very seriously involved in bridging the gap between the health care resources and the needs and the aspirations of the people. India's commitment to Health for All and the subsequent National Health Policies are honest indications of the concerns that the government has for its people, especially the rural, tribal and the poor. With recent flagship programmes such as National Rural Health Mission, this commitment has been further strengthened. However, in spite of such concerted effort, the reach of health care to every nook and corner of India is a gigantic challenge. One of the important impediments is India's diversity and heterogeneity. Such a diverse mass of humanity has varied cultural and social aspirations and expectations. Due to these factors even the most tested and well

contributors of papers. Finally, we express our deep sense of gratitude to Prof. R.K. Mutatkar, in whose honour the Conference was organized, for gracing the occasion and accepting our felicitations.

K. H. Bhat,
P. C. Joshi and **B. R. Vijayendra**
(Editors)

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4
Assessment of Nutritional Status among Kadu Kuruba Tribal Children of Mysore District, Karnataka

S.C. Jai Prabhakar and *M.R. Gangadhar*

Introduction

Growth and nutritional studies are valuable as they provide information on the health status of a community, and also be helpful for improving the health conditions (Dutta, 1997). Life cannot be sustained without adequate nourishment. Man needs adequate food for normal growth and development. Proper nutrition keeps man healthy and fit whereas inadequate or improper nutrition reduces fitness and causes susceptibility to diseases. Assessment of nutritional status is considered as a measure of health and it is necessary for planners to understand the food and nutrition situation for upliftment of the vulnerable tribal populations. Most of the research work that has been conducted on nutritional status of children is limited to infants and preschool children only. There is dearth information on nutritional status of school going children particularly from tribal areas. Hence, to fill up some of this knowledge gap, the present study was carried out to assess the nutritional status of the Kadu Kruruba children of Mysore district, Karnataka State based on Anthropometry.

Population

Kadu Kuruba is also called Betta Kuruba. The Betta Kurubas are one of the sub-groups of the Kuruba, inhabitating the areas of Wynad, Nilgiris and the Mysore district. The Kadu Kurubas are small active people capable of great fatigue and experts at forest work. The Betta Kuruba an endogamous population in Karnataka. They are concentrated in the Mysore district and also in Kodagu, Dakshina Kannada and Hassan district, within Mysore district; they are settled in H.D. Kote, Hunsur, Piriyapattana and Nanjangud taluks. Kadu or Betta Kuruba speaks a dialect of their own, which is having similarity with Kannada language (Satish Kumar, 2008). The Kadu Kurubas are non-vegetarian, who eat pork, but not beef. Ragi is their staple food. Ragi ball and soppu (leafy vegetables) are their common dishes. They also eat a variety of pulses and vegetables. Fruit consumption is very low. They drink coffee and tea. Arrack and toddy are consumed by both men and women, chewing of betal leaves are common. On the festive occasions, they prepare dosa, idli, uppittu and payasa.

The Kadu Kurubas are considering themselves superior to the Jenu Kurubas and do not interdine or intermarry with them. Cross-cousin marriages are prevalent. Pre-puberty marriages are not allowed. Monogamy is the norm. After marriage, the bride goes to the husband's house. Children are the responsibility of the father. If the first wife is barren, remarriage is allowed for a man. In such cases, the wife's sister is preferred for the second marriage. Nuclear family is more among the Kadu Kurubas. The father's status is inherited by the eldest son. The Kadu Kuruba women, besides looking after their children and doing domestic duties, go to the forest to collect edible leaves and roots and collect fuel and fodder. Women also do agricultural labours and in the harvesting season, help their husbands in cultivation. Kadu Kurubas bury their dead in prone posture and east-west direction. Eleventh day ceremony is performed. The Kadu Kurubas also work as daily labourers. The community consists of both landowning and landless groups. Apart from agriculture, they are also engaged in collection of forest produce and rolling of *beedis*. Some of them also make baskets and sell bamboo products in the nearby village. They also believe in ghosts and spirits and have their own family and community deities.

Materials and Methods

The present study is based on cross-sectional sample of 151 (76 boys and 75 girls) Kadu Kuruba children belonging to the age-group of 6+ to 10+ years during the month of September to November, 2006. Data on age were based on school records. The samples were collected from different Ashrama schools and tribal settlements of Hunsur, Piriyapattana, Nanjanagudu and H.D. Kote taluks of Mysore district, Karnataka state, following purposive sampling technique.

The anthropometric measurements (height, weight, mid upper arm circumference and triceps skin fold thickness) of Kadu Kuruba children were recorded using techniques given by Jelliffe (1966). Height was measured with the help of anthropometric rod and weight by personal weighing balance with minimum clothing. The scale was calibrated against known weights regularly. Mid-Upper Arm Circumference (MUAC) was recorded with the help of flexible measuring steel tape to the nearest 0.1 cm. The thickness of skin fold at triceps was measured using Lange's skin fold caliper. Height and weight measurements of the children, taking age and sex into consideration were expressed in terms of Z-score relative to National Centre for Health Statistics (NCHS, 1983) reference data recommended by World Health Organization (WHO) (De Onis *et al.*, 2007). Thus, those below -2SD of NCHS median reference for height-for-age, weight-for height, weight-for-age and are defined stunted, wasted and under nutrition respectively. The data analysis was carried out using statistical software package SPSS 12.0 version.

Results and Discussion

The mean and standard deviation values of anthropometric measurements among Kadu Kuruba tribal children were presented in Table 4.1 according to the age and sex. In both the sexes mean height and weight were increased consistently with the increase in age. The maximum mean incremental difference in height among boys was +8.09 cm and +6.62 cm among girls between the age-group of 8+ and 9+ years. Girls were slightly taller in the age-group of 6+ and 7+ and heavier in the age-group of 8+ to 10+ years than boys of same age-group. In contrast boys of 9+ years aged were taller by 3.9 cm as compared to the girls of same age-group. However, the mean weight of both sex in the age-group of 9+ years were almost same.

The maximum and minimum mean annual incremental difference of mid-Upper Arm Circumference (MUAC) and Mid-Upper Arm Muscle Circumference (MUAMC) of girls is higher than boys. However, mean MUAC and MUAMC were comparable in both genders in the same age-group. The Kadu Kuruba children were shorter and lighter when compared with NCHS Standards. Sirajuddin *et al.* (1992) revealed in their study that Physically Betta Kurubas are mostly short to very short stature people with a mean stature of 1548.1 mm.

Weight-for-age indicates the underweight of the child (Table 4.2). 53.7 per cent of children were malnourished, whereas 46.3 per cent were normal. The severity (<-3SD) was 12.6 per cent however, highest percentages (41.1%) of children were revealed under moderate category. In the age-group of 8+ years, there is no severely malnourished girls were found. Nevertheless no single boys were normal under the age-group of 9+ and 10+ years. The Contingency Coefficient (CC) and significant value revealed that, there is insignificant association in all the age-groups between the genders. The results are in coherence to the findings an earlier study conducted by Prabhakar and Gangadhar (2009) revealed that 45.2 per cent of children were moderately malnourished among Jenu Kuruba tribal children of Mysore district. The results of the Nutritional Status of Girls Studying in a Government School in Jaipur City revealed that about 72 per cent of the subjects as per weight for age criterion and 37 per cent of the subjects as per height for age criterion were suffering from various degrees of malnutrition (Anuradha Goyle, 2009).

Table 4.3 shows number and percentage of prevalence of height deficit. Nearly half (44.4%) of the children were found under the grade of stunting. However, severe grade stunting was 13.3 per cent. Highest percentages of (31.1%) children were observed under moderate and mild category. Only 24.5 per cent of children were normal in their height for age. The contingency coefficient (c.c.) and significance value reveals, there is no significant difference ($p>0.05$) in all the age-groups between the gender. Similar study found among Sonowali Kachari Children (Singh and Sengupta, 2007) revealed that, highest percentage of moderately stunted was 28 per cent in the age-group of 6 and 9 years. Urade *et al.* (2004) found that, 44.12 per cent of Khaire Kunbi Children of Maharashtra were mildly stunted.

Table 4.4 indicates the prevalence of wasting of the child. Combining all the gender and age-group, about 62.9 per cent were normal and 37.1 per cent of children were deficit in weight for height.

Table 4.1: Mean and Standard Deviation of Anthropometric Measurements According to Age and Sex

Age		Boys				Girls			
		Height	*Weight*	*MUAC*	*MUAMC*	*Height*	*Weight*	*MUAC*	*MUAMC*
6+	Mean	105.83	15.67	14.1	12.72	107.78	13.95	13.80	11.84
	± SD	±5.92	±2.54	±1.4	±1.4	±6.60	±2.28	±0.73	±0.88
7+	Mean	111.85	17.90	14.82	13.28	113.53	15.67	15.36	13.64
	± SD	±5.5	±2.49	±1.11	±1.3	±5.08	±2.27	±0.95	±1.19
8+	Mean	117.73	17.91	14.49	13.14	115.30	19.63	14.18	12.29
	± SD	±4.96	±2.53	±1.38	±1.34	±5.43	±2.18	±1.06	±1.28
9+	Mean	125.82	20.11	15.04	13.59	121.92	20.33	15.3	13.58
	± SD	±5.83	±2.39	±0.91	±1.02	±5.86	±2.98	±0.91	±1.13
10+	Mean	127.25	21.92	14.21	12.78	124.71	24.35	14.28	12.36
	± SD	±4.37	±2.37	±1.46	±1.4	±4.37	±4.87	±1.01	±1.20

Table 4.2: Nutritional Status According to Weight for Age (Under Weight)

Age	Gender	?-3SD (Severe)	-3SD to <-2SD (Moderate)	-2SD to <-1SD (Mild)	>-1SD to Median (Normal)	C.C.	Sig.
6+	B 12	3 (25.0)	2 (16.7)	6 (50.0)	1 (8.3)	0.453	0.091
	G 13	4 (30.8)	7 (53.8)	1 (7.7)	1 (7.7)		
7+	B 15	2 (13.3)	6 (40.0)	5 (33.4)	2 (13.3)	0.293	0.377
	G 18	3 (16.7)	6 (33.3)	9 (50.0)	-		
8+	B 17	3 (17.7)	9 (52.9)	4 (23.5)	1 (5.9)	0.437	0.051
	G 16	-	4 (25.0)	10 (62.5)	2 (12.5)		
9+	B 19	1 (5.3)	10 (52.6)	8 (42.1)	-	0.243	0.510
	G 18	1 (5.6)	9 (50.0)	6 (33.3)	2 (11.1)		
10+	B 13	1 (7.7)	6 (46.1)	6 (46.1)	-	0.476	0.081
	G 10	1 (10.0)	3 (30.0)	2 (20.0)	4 (40.0)		
Total	151	19 (12.6)	62 (41.1)	57 (37.7)	13 (8.6)		

Figures in parentheses shown in percentage

C.C. = Contingency Coefficient

B=Boys, G=Girls

Table 3.3: Nutritional Status According to Height for Age (Stunting)

Age	Gender	≤-3SD (Severe)	-3SD to <-2SD (Moderate)	-2SD to <-1SD (Mild)	>-1SD to Median (Normal)	C.C.	Sig.
6+	B 12	3 (25.0)	4 (33.3)	3 (25.0)	2 (16.7)	0.302	0.474
	G 13	2 (15.4)	3 (23.1)	2 (15.4)	6 (46.1)		
7+	B 15	3 (20.0)	5 (33.3)	5 (33.3)	2 (13.4)	0.361	0.175
	G 18	1 (5.6)	6 (33.3)	3 (16.7)	8 (44.4)		
8+	B 17	1 (5.9)	7 (41.2)	7 (41.2)	2 (11.8)	0.200	0.710
	G 16	3 (18.8)	5 (31.2)	6 (37.5)	2 (12.5)		
9+	B 19	2 (10.5)	1 (5.3)	6 (31.6)	10 (52.6)	0.381	0.098
	G 18	4 (22.2)	4 (22.2)	7 (38.9)	3 (16.7)		
10+	B 13	–	5 (38.5)	6 (46.1)	2 (15.4)	0.424	0.170
	G 10	1 (10.0)	7 (70.0)	2 (20.0)	–		
Total	151	20 (13.3)	47 (31.1)	47 (31.1)	37 (24.5)		

Figures in parentheses shown in percentage

C.C. = Contingency Coefficient

Table 4.4: Nutritional Status According to Weight for Height (Wasting)

Age	Gender	?-3SD (Severe)	-3SD to <-2SD (Moderate)	-2SD to <-1SD (Mild)	>-1SD to Median (Normal)	>+2SD (Over Weight)	c.c.	Sig.
6+	B 12	2 (16.7)	2 (16.7)	2 (16.7)	5 (41.6)	1 (8.3)	0.389	0.348
	G 13	6 (46.1)	2 (15.4)	3 (23.1)	2 (15.4)	–		
7+	B 15	3 (20.0)	–	3 (20.0)	6 (40.0)	3 (20.0)	0.459	0.117
	G 18	6 (33.3)	3 (16.7)	6 (33.3)	3 (16.7)	–		
8+	B 17	5 (29.4)	2 (11.8)	5 (29.4)	4 (23.5)	1 (5.9)	0.442	0.092
	G 16	–	1 (6.2)	4 (25.0)	10 (62.5)	1 (6.2)		
9+	B 19	5 (26.3)	9 (47.4)	2 (10.5)	3 (15.8)	–	0.466	0.017
	G 18	1 (5.6)	3 (16.7)	8 (44.4)	6 (33.3)	–		
10+	B 13	3 (23.1)	1 (7.7)	4 (30.8)	5 (38.4)	–	0.443	0.345
	G 10	1 (10.0)	1 (10.0)	1 (10.0)	4 (40.0)	3 (30.0)		
Total	151	32(21.2)	24 (15.9)	38 (25.2)	48 (31.8)	9 (5.9)		

Note: Figures in parentheses shown in percentage

C.C. = Contingency Coefficient

Table 4.5: Per cent Prevalence of Malnutrition According to SD Classification

Indicators	≤-3SD	-3SD to <-2SD	-2Sd to <-1SD	>-1SD to <Median	≥Median
	Severe	Moderate	Mild	Normal	
Weight for Age (Underweight)	12.6	41.1	37.7	8.6	–
Height for Age (Stunting)	13.3	31.1	31.1	24.5	–
Weight for Height (Wasting)	21.2	15.9	25.2	31.8	5.9

Table 4.6: Nutritional Status According to Body Mass Index

Age	Gender	≤-3SD (Severe)	-2SD to >+2SD (Normal)	C.C.	Sig.
6+	B 12	5 (41.7)	7 (58.3)	0.195	0.320
	G 13	8 (61.5)	5 (38.5)		
7+	B 15	4 (26.7)	11 (73.3)	0.231	0.172
	G 18	9 (50.0)	9 (50.0)		
8+	B 17	8 (47.1)	9 (52.9)	0.416	0.009**
	G 16	1 (6.3)	15 (93.7)		
9+	B 19	13 (68.4)	6 (31.6)	0.377	0.013*
	G 18	5 (27.8)	13 (72.2)		
10+	B 13	5 (38.5)	8 (61.5)	0.283	0.369
	G 10	2 (20.0)	8 (80.0)		
Total	151	60 (39.74)	91 (60.26)		

Note: Figures in parentheses shown in percentage

C.C. = Contingency Coefficient

* Significant association

** Highly significant association

However, 5.9 per cent of children were found to be overweight category particularly more among 7+ year boys and 10+ year girls. The result shows there is no significant association in the prevalence of wasting between boys and girls.

Table 4.5 reveals that, the proportion of children with low body weight (<-2SD) was 53.7 per cent. While severe grade (<-3SD) under weight was 12.6 per cent. The overall stunting was 44.4 per cent and wasting was 37.1 per cent and severely stunting and wasting was 13.3 per cent and 21.2 per cent respectively among the children of Kadu Kuruba Tribe. Singh *et al.* (1996) determined the nutritional status of school age children (6-18 years) in various salt manufacturing sites of Rajasthan using anthropometry. The prevalence of stunting with severe wasting was 4.5 per cent in the children of salt workers.

Body Mass Index (BMI) for age and gender (Table 4.6) shows 60.26 per cent of children were normal and 39.74 per cent were slightly under nourished. Girls of 8+ to 10+year age-group are slightly better nourished as compared to boys of the same age-group. Body mass index is generally considered as the best indicator of fatness or thinness and chronic energy deficiency. The prevalence of under-nourished Kadu Kuruba children according to BMI is not as high as indicated by weight for age, height for age and weight for height. It may be noted that, if the population is characterized by a high

prevalence of CED, which is a common characteristic of rural populations in the Indian sub-continent (Khongsdier, 2002).

Conclusion

The present study reveals that, Kadu Kuruba tribal children of Mysore district are suffering from various degrees of malnutrition and attained lower level of growth compared to NCHS Standard. Their nutritional status on the whole is very unsatisfactory. The Government should take effective measures to improve the nutritional status of Kadu Kuruba children and to educate the parents especially the mother regarding diet, which provide the required nutrients to overcome the nutritional deficiency of children.

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