

Levels of Malnutrition and Socio-Economic Conditions Among Maria Gonds

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ABSTRACT Socio-economic conditions like agricultural pattern and occupation structure are different among the tribals and are determined by the ecosystem in which they live. A comparative study was made between Maria Gonds of Bhamragad area of Maharashtra and Bastar of Madhya Pradesh which are adjacent to each other. The average monthly per caput income was Rs. 50/- among Maria Gonds of Bhamragad and it was only Rs. 28/- among Maria Gonds of Bastar. Labour (66.2%) was major source of income in Bhamragad as against agriculture (69.9%) in case of Bastar. Both by extent and type of malnutrition, Maria Gonds of Bhamragad were comparatively better than those of Bastar. The dependency of the Maria Gonds of Bastar entirely on primitive form of agriculture with very low yields of food grains and lack of income generating activities in the area resulted in low per capita income which ultimately reflected in their poor nutritional status.

INTRODUCTION

Health is an important aspect of development and progress and nutrition is considered as a measure of health. It is necessary for planners to understand the food and nutrition situation among tribal population for the upliftment of these vulnerable groups. Nutritional status depends on the consumption of food in relation to the needs. It is influenced by the availability of food and purchasing power. The socio-economic conditions like agricultural pattern and occupation structure are all different among the tribals and is determined by the ecosystem in which the tribe lives.

Gonds are one of the major tribes of India, scattered over a wide geographical area extending from Adilabad in Andhra Pradesh, Gadchiroli district in Maharashtra and Bastar to Sarguja in Madhya Pradesh. The Bhamragad area in Gadchiroli district of Maharashtra and Bastar area of Madhya Pradesh are adjacent to each other. Both are dense forest areas. The tribe of Maria Gonds of Bhamragad area in Maharashtra was listed as one of the primitive

tribes of the State (Report on the Working Group on Development of Scheduled Tribes - December, 1984) based on their low population growth rate, low literacy level and preagricultural level of technology. This is a forest dwelling tribe with scattered population. Shifting cultivation is the principle occupation. Collection of forest produce is another means of their livelihood. Forest labour such as bamboo cutting for paper mills and collection of beedi leaves, contributes most of the income. In contrast the Maria Gonds of Bastar were settled cultivators and agriculture forms the major source of income followed by forest produce.

Rice is the staple grain and forms an important item of daily diet in both the tribal areas. These tribal groups also depend to a great extent on food gathering from forest which is dense and yields variety of roots and tubers, green leaves, mushrooms, mohua flowers and fruits and bambooshoots in abundance. Field mice and red ants are their favourite food items.

Hence an attempt was made with the objective to study the socio-economic condition:

and levels of malnutrition among Maria Gonds of Bhamragad in comparison with their counterparts of Bastar to know the association between nutritional status and the type of economy of the community.

MATERIALS AND METHODS

A total of 25 villages were surveyed out of which nineteen villages were from Bhamragad area and six villages were from Etapalli block. In each of the selected village every fifth house was covered for collection of socio-economic information. The head of the household was the respondent for this purpose. In every alternate household contacted for socio-economic survey, oral questionnaire (24 hour recall) method of diet survey was conducted. Anthropometric measurements like height and weight were taken on all the available individuals in the village at the time of visit.

Average values of body weight, and height, no doubt, are known to reflect the general health and nutritional status of population. These are however, not sensitive enough to reflect the true extent and type of malnutrition prevalent in communities. Hence, distributional analysis of indices based on body measurements have often been suggested not only to quantify malnutrition in communities, but also for inter-community comparisons. Hence, body weight for age classification of Gomez (Gomez et al., 1956) and the classification suggested by Waterlow (Waterlow et al., 1977) based on weight for height and height for age have been used in the present analysis. Well-to-do Hyderabad children were used as standards (Hanumantha Rao et al., 1976).

The results of the present study were compared with that of the earlier study on the Maria Gonds of Bastar, Madhya Pradesh conducted by National Institute of Nutrition (Hanumantha Rao et al., 1986) in order to find out the differences in socio-economic

conditions and nutritional status among these two tribal groups.

RESULTS AND DISCUSSION

Economic Status

The average monthly per caput income was Rs. 50/- among the Maria Gonds of Bhamragad, while it was only Rs. 28/- among their counterparts in Bastar (Table 1). Labour (66.2%) was the major source of income in Bhamragad as against agriculture (69.9%) in Bastar. Income from forest constituted 6.3% in case of Maria Gonds of Bhamragad and 13.3% in case of Bastar. Thus the Maria Gonds of Bhamragad seem to depend mainly on forest labour followed by agriculture while those of Bastar mainly depended on agriculture with very little income from labour and forest. It may be emphasised here that the Maria Gonds of Bastar followed primitive form of agriculture, with minimal use of pesticides and fertilizers. In general, the yield from the agricultural land was low and the produce was mostly used for domestic consumption only.

Food and Nutrient Intake

The average daily intake of cereals and millets was higher among Maria Gonds of Bhamragad (671 g/CU/day) as compared to those of Bastar (538 g) as well as RDI (460

Table 1 : Percentage contribution of income (percaput/month) from different sources

Sources of income	Maria Gonds of Bhamragad		Maria Gonds of Bastar	
	Per caput/month (Rs.)	% contribution to total income	Per caput/month (Rs.)	% contribution to total income
Agriculture	10.6	21.2	19.6	69.9
Labour	33.1	66.2	4.6	16.5
Forest produce	6.3	12.6	3.7	13.3
Livestock	—	—	0.1	0.3
Pooled	50.0	100.0	28.0	100.3

Table 2 : Average intake of different foodstuffs (g/CU/day) among Maria Gonds of Bhamragad and Bastar

Tribe	Cereals and Millets	Pulses	GLV	Other veg. & R & T	Fruits	Milk & Milk prod.	Oil and Fats	Sugar and Jaggery	Flesh Foods	Liquor
Present Study	671	9	55	84	11	2	4	4	11	67
Gonds of Bastar	538	23	10	35	24	1	0	1	0	22
RDA (1969)	460	40	40	110	—	150	40	30	—	—

g), (Recommended Dietary Intakes for Indians, 1979) (Table 2). The consumption of pulses was much less among Maria Gonds of Bhamragad (9g) while it was about 57% of RDI (23 g) among those of Bastar. In contrast the intake of green leafy vegetables was more than RDI among Maria Gonds (55 g) of Bhamragad while the intake was low (10 g) in Bastar. The consumption of protective foods like fruits, milk and milk products, sugar and jaggery, oils and fats were much less than the RDI in both the tribal groups.

The average daily consumption of nutrients (per CU) was given in table 3. Except for calcium, vitamin 'A', the consumption of other nutrients were higher than RDI among Maria Gonds of Bhamragad. The consumption of all the nutrients except iron were lower in Bastar than the RDI as well as with their counterparts of Bhamragad. The average energy and protein intake was 2360 kcal and 62 g per CU/day among Maria Gonds of Bhamragad, while it was only 2038 kcal and 51 g among the Maria Gonds of Bastar. The intake of Vitamin A was much less than the recommended level 750 µg

among both Maria Gonds of Bhamragad as well as Bastar (405 µg and 227 µg, respectively).

Growth Status

The age and sex wise mean heights and weights of Maria Gonds of Bhamragad and Bastar were presented in tables 4-7.

The preschool boys and girls of Bhamragad were taller by about 2-3 cm and heavier by about half a kg than those of Bastar. The boys and girls of school age group were having more or less similar heights and weights among both the groups. However, the adolescents of Maria Gonds of Bhamragad were taller and heavier than those of Bastar in both sexes. While the adult males of both the tribes were having comparable heights, Maria Gonds of Bhamragad found to be heavier by 2-3 kg. Though the adult females of Maria Gonds of Bhamragad were taller than those of Bastar, their body weights were comparable. The results indicated that in general, Maria Gonds of Bhamragad were having better growth status than those of Bastar.

Table 3 : Average intake of different nutrients (CU/day) among Maria Gonds of Bhamragad and Bastar

Tribe	Calories (Kcal)	Protein (g)	Calcium (mg)	Iron (mg)	Vit. A (µg)	Thiamine (mg)	Riboflavin (mg)
Present Study	2630	62	235	26	405	2.47	1.48
Gonds of Bastar	2038	51	242	27	227	0.60	0.50
RDA (1989)	2425	60	400	28	600	1.20	1.40

Table 4 : Mean anthropometric measurements of preschool children by age and tribe

Age (years)	Tribe	Male			Female		
		n	Height	Weight	n	Height	Weight
1+	Present Study	28	73.3±3.91 ¹	8.1±1.21 ¹	32	72.1±3.53	7.4±0.82
	Gonds of Bastar	88	71.0±5.63	7.4±1.29	74	71.0±5.49	7.2±1.29
2+	Present Study	38	80.1±4.02	9.6±1.19 ¹	32	80.3±3.63	9.2±1.18
	Gonds of Bastar	84	78.2±5.67	8.9±1.54	99	78.5±5.34	8.7±1.44
3+	Present Study	40	88.4±3.31	11.1±1.16	47	87.7±4.54	10.8±1.35
	Gonds of Bastar	112	87.3±9.42	11.2±3.56	80	86.2±5.48	10.4±1.54
4+	Present Study	46	97.4±5.20 ¹	13.0±1.52 ¹	46	95.9±4.60 ¹	12.4±1.26
	Gonds of Bastar	92	93.6±6.50	12.0±1.65	104	93.3±6.26	12.0±1.97

1. P < 0.05

Levels of Malnutrition

The percentage distribution of preschool children according to body weight status (Gomez's classification) was given in table 8. The percentage of children suffering from severe degree malnutrition (*i.e.* body weight less than 60% of standard) was significantly higher (9.8%) among the Maria Gonds of Bastar than that of Bhamragad (2.9%). The proportion of children with moderate degree of malnutrition (having body weights in the range of 60-75% of standard) was higher among the Maria Gonds of Bastar (40.4%) as compared to those of Bhamragad (34%). However, the percentage of normals in both the groups were comparable.

The percentage of normals by Waterlow's classification was high among Maria Gonds of Bhamragad (56.6%) as compared to those of Bastar (41.1%) (Table 9). The proportion of preschoolers who were classified as having stunted growth was very high with 51.3% among the Maria Gonds of Bastar as compared to 36.9% among those of Bhamragad. However, the proportion of children with wasting was similar in both the groups.

Thus distribution of preschool children according to Gomez as well the Waterlow's classification revealed that the Maria Gonds of Bhamragad area were nutritionally better than the Bastar. Children in Bastar were worse off with greater extent of under nutrition and

Table 5 : Mean anthropometric measurements of school age children by age and tribe

Age (years)	Tribe	Male			Female		
		n	Height	Weight	n	Height	Weight
5+	Present Study	23	101.3±4.3	13.9±1.51	22	101.9±4.90	13.6±1.37
	Gonds of Bastar	94	98.5±9.11	13.7±3.51	92	100.0±5.73	13.4±1.64
6+	Present Study	39	106.3±3.79	15.1±1.38	22	107.7±3.49	15.4±1.17
	Gonds of Bastar	87	107.6±6.28	15.5±2.02	109	107.7±6.02	15.2±1.93
7+	Present Study	38	112.4±5.11	17.3±1.85	28	110.0±5.31	16.2±1.63
	Gonds of Bastar	57	112.8±6.60	17.3±2.43	60	112.7±6.59	16.6±2.38
8+	Present Study	25	116.7±6.51	18.3±2.53	29	116.0±4.48	17.8±1.67
	Gonds of Bastar	109	117.2±8.55	18.7±3.10	69	116.7±8.00	18.4±3.03
9+	Present Study	21	123.7±7.13	20.8±2.03	15	119.5±4.29	18.7±1.27
	Gonds of Bastar	30	125.5±7.63	21.8±3.91	25	123.5±10.4	20.7±4.38
10+	Present Study	31	127.2±6.69	22.7±4.03	20	126.8±4.96	22.5±2.73
	Gonds of Bastar	120	127.9±8.54	22.7±3.58	98	128.4±8.82	23.2±4.16
11+	Present Study	26	130.9±8.14	24.1±4.45	15	133.6±6.74	24.8±3.45
	Gonds of Bastar	30	132.4±9.44	24.6±2.91	32	132.9±7.88	26.1±4.09

Table 6 : Mean anthropometric measurements of adolescents by age and tribe

Age (years)	Tribe	Male			Female		
		n	Height	Weight	n	Height	Weight
12+	Present Study	15	139.4±1.64	28.8±4.17	14	141.3±6.14 ¹	29.7±4.72
	Gonds of Bastar	86	135.9±10.12	26.9±5.39	76	135.2±6.93	27.0±4.87
13+	Present Study	14	144.2±9.35	29.2±4.76	12	144.3±5.19 ¹	31.0±3.10
	Gonds of Bastar	51	140.7±9.49	29.7±5.99	34	138.6±8.37	29.9±6.33
14+	Present Study	09	147.0±8.5	34.5±4.94	10	145.2±2.91	32.9±3.28
	Gonds of Bastar	98	145.1±9.16	32.3±6.14	67	141.0±8.23	30.6±7.12
15+	Present Study	22	154.3±5.37	38.9±4.10	08	147.9±6.37	35.2±4.74
	Gonds of Bastar	55	150.5±9.06	36.8±7.07	50	145.2±6.48	35.9±5.71
16+	Present Study	08	158.1±5.72	42.8±3.46	05	147.7±3.33	38.2±2.53
	Gonds of Bastar	74	154.1±9.98	39.6±5.55	103	147.7±5.35	38.9±5.10
17+	Present Study	10	158.7±6.33	42.8±2.54	3	146.5±2.95	39.5±3.96
	Gonds of Bastar	36	156.9±5.92	43.2±5.40	51	149.3±5.35	41.2±5.21
18+	Present Study	13	161.0±4.99	45.1±5.31	12	148.7±5.55	46.2±4.25 ¹
	Gonds of Bastar	94	157.3±6.84	42.6±8.17	77	148.2±5.54	40.3±5.21
19+	Present Study	07	160.1±4.50	47.5±4.14	10	145.0±7.15	39.0±3.74
	Gonds of Bastar	53	160.2±6.62	44.9±5.03	27	149.0±5.10	40.2±3.79

1. P<0.05

Table 7 : Mean anthropometric measurements of adults by age and tribe

Age (year)	Tribe	Male			Female		
		n	Height	Weight	n	Height	Weight
20+	Present Study	130	160.5±6.85	47.2±4.55 ¹	129	149.5±4.78	40.4±4.68
	Gonds of Bastar	368	160.0±7.12	45.7±6.19	372	148.6±5.12	40.4±4.96
30+	Present Study	123	159.4±6.11	48.3±4.82 ¹	74	149.9±5.01	40.3±4.77
	Gonds of Bastar	427	159.2±5.98	45.7±5.05	447	148.7±5.29	39.6±4.90
40+	Present Study	73	159.5±4.90	48.3±5.29 ¹	40	150.0±5.54	39.7±4.08
	Gonds of Bastar	340	159.6±6.00	45.4±6.02	92	148.0±5.88	38.2±5.57
50+	Present Study	50	157.7±8.27	45.9±5.27	53	149.4±4.32 ¹	37.9±4.34
	Gonds of Bastar	162	157.9±6.20	44.5±5.24	116	147.4±6.11	38.2±4.76

1. P <0.05

Table 8 : Percentage distribution of preschool children according to Gomez classification

Tribes	n	Gomez Grades			
		Normal	Mild	Moderate	Severe
Present Study	309	9.1	54.0	34.0	2.9
Gonds of Bastar	725	9.3	40.5	40.4	9.8

 $\chi^2_{(3)} = 24.4$; $p < .001$

Table 9 : Percentage distribution of preschool children according to Waterlow's classification

Tribes	n	Waterlow Grades			
		Normal	Stunted	Wasted	Stunted & Wasted
Present Study	309	56.6	36.9	3.6	2.9
Gonds of Bastar	725	41.1	51.3	3.7	3.9

 $\chi^2_{(3)} = 21.6$; $p < .001$

higher stunting as compared to Maria Gonds of Bhamragad reflecting long duration malnutrition. The dependency of the Maria Gonds of Bastar entirely on primitive form of agriculture with very low yields of food grains and lack of income generating activities in the area resulted in low per capita income which has contributed significantly to their poor nutritional status. In contrast among the Maria Gonds of Bhamragad, the income from labour activity was better and relatively more stable, which has resulted in better consumption levels which in turn led to better nutritional status. Hence, income generating programmes like forest or other labour, cottage industries, horticulture etc., should be initiated in tribal areas which will help them to improve their economic status, to ensure better nutritional status of these tribes.

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REFERENCES

- Gomez, F., Galvan, R., Frenk, S. Cravioto, J., Chavez, R. and Vasquez, J. : Mortality in second and third degree malnutrition. *J. Trop. Pediat.*, 2 : 77-83 (1956).
- Hanumantha Rao, D., Mathur, Y.N., Radhaiah, G. and Pralhad Rao, N. : *Health and Nutritional Status of Tribals of Madhya Pradesh*. Report, National Institute of Nutrition, Hyderabad (1986).
- Hanumantha Rao, D., Satyanarayana, K., and Sastry, J.G. : Growth pattern of well-to-do Hyderabad preschool children. *Ind. J. Med. Res.*, 64 : 629-638 (1976).
- Recommended Dietary Intake for Indians*. Indian Council of Medical Research, New Delhi (1989).
- Report on the Working Group on Development of Scheduled Tribes During Seventh Five Year Plan (1985-90)*. Government of India, Ministry of Home Affairs, New Delhi (December-1984).
- Waterlow, J.C. Buzina, R., Keller, W., Lane, J.M., Nichaman, H.Z. and Tanner, J.M. : Presentation and use of height and weight data for comparing nutritional status of children under age of 10 years. *Bull. WHO*, 55 : 489-498 (1977).