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## **Nutritional Status of Adult Women Belonging to Khond, Gadaba and Porja Tribes of Andhra Pradesh**

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### **Introduction**

In India tribals are neglected a lot, discriminated in terms of income distribution and social status. Most Of them are desperately poor, backward, generally uneducated and lead a hard and miserable life.[1] There are more than 400 tribal communities In India, out of which 75 Primitive Tribal Groups (PTG) have been Identified by the government by 1989.[2]

Tribal women in India are at a great disadvantage due to illiteracy and ignorance. Various research studies on tribal population of India revealed that their diets are nutritionally deficient. There is paucity of information regarding the women of the PTG and hence this investigation was undertaken to study the socio-economic and dietary background and to assess the nutritional status of selected women from three primitive groups of Andhrapradesh.

### **Materials and Methods**

Out of the eleven mandals in Visakhapatnam district under Integrated Tribal Development Project, Paderu mandal was selected for conducting the study as this mandal had the highest concentration of scheduled tribes than others.

The selected three tribes included Khond, Gadaba and Porja belonging to the PTG and formed the lowest strata among the scheduled tribes. A multi-stage random sampling was used for the study. Out of the 82 villages, a total of 40 were selected randomly and the survey was conducted among, 273 families from a total of 560 families representing a proportionate sample. From the selected households all the non-pregnant adult women numbering 311 in the age group of 20-39 years were selected for the study.

Information on the socio-economic and dietary background of the selected families was collected using a specially designed interview schedule. Anthropometric measurements such as height and weight of the selected women were taken following the standard procedures.[3] Body Mass Index (BMI) was computed using the height weight data.

Clinical examination of all the 311 women was done using a schedule based on Jelliffe[3] and ICMR[4]. A three day food weighment survey was carried out to determine the food and nutrient intake of ten per cent of the selected sample namely 31 adult women. Blood haemoglobin level was estimated using cyanmethaemoglobin method outlined by NIN (1983) among 10 per cent of the total sample.

## **Results and Discussion**

Majority (78-92%) of the families of the three tribal groups were of nuclear type. About 50 per cent of the families consisted of more than five members. Majority (87-98%) of the 'tribal women were illiterate. Among the three groups, Gadaba women had better, educational status.

Collection of minor forest produce formed the major occupation among the tribes (69-78%) followed by agriculture, cattle rearing, poultry keeping and pig rearing. The income (Rs.100- 600/month) of the tribal families was hardly sufficient to sustain their livelihood. Nearly 59 to 65 percent of families had a monthly income between Rs. 150 to 300/.

Monthly expenditure pattern revealed that 61-81 per cent of their in-come was spent on food by all the three tribes and no expenditure was in-curred on education and health. Majority of the tribals had their own houses of katcha type with thatched huts covered by 'Copirigadda grass available on the hills during summer. The interior villages did not have facilities like schools, balwadis, PHC, electricity, transportation and protected water supply. Out of the 40 villages surveyed, eight villages had single teacher schools.

## **Dietary information about the tribal families**

Rice, ragi, jowar, bajra and wheat were procured by the tribals from the tribals from the Girijan Co-operative Corporation (GCC) at subsidised rates, Cereals in general accounted for the major part (72%) of the food expenditure among all the three tribes. No expenditure was incurred on green leafy vegetables, fruits and milk and milk products, among the families.

The tribal diet was monotonous, lacking variety and they cared more for the bulk rather than quality of, the diet. The common meal pattern included cereal (millet) gruel either fermented or unfermented, for breakfast and rice with vegetables or dhal for dinner.

Boiling method was commonly used for cooking by all the tribals. They also used at times, dry roasting, shallow fat trying and smoking. Nearly one fourth of the tribal families had kitchen garden from which they got some greens and roots and tubers.

The main storage structures for cereals were found to be mudpots, gunny bag and at times metal tins. Bamboo baskets were commonly used for storing dried fish and meat. Infant feeding practices indicated that colostrum was fed to infants by mothers of all the tribes and breast feeding was continued till 12-24 months which is more encouraging. But the child feeding practices were found to be unsatisfactory. Infants were weaned only at the age of ten months and were fed directly with adult diets.

Male members were given preference in feeding compared to females among all the tribal families. Severe food restrictions were followed during pregnancy, lactation and ill health.

The tribals had deeprooted beliefs and considered foods as hot (maize, jowar, mangoes), cold (rice bear, mahua alcohol), gas producing (green leafy vegetables, peanuts), abortive foods (papaya, pumpkin) and causing skin diseases (brinjal, yam, egg) which deterred the tribals from using even the locally available inexpensive foods. During festivals, tribals used to prepare non-vegetarian items. Alcohol consumption was more common among both the sexes.

### **Nutritional status of the tribal women**

Table I presents the anthropometric measurements of women of the three tribes according to age.

**Table I:** Comparison of Mean Anthropometric Measurements Among Adult Women by Age and Tribe

	Khond		Gadaba		Porja	
Anthropometric measurements	20-29 yrs.	30-39 yrs.	20-29 yrs.	30-39 yrs.	20-29 yrs.	30-39 yrs.

Sample size	112	88	26	28	32	25
Height (cm)	145.78	146.28	146.21	146.23	146.21	146.84
	± 2.92	± 2.58	± 2.91	± 2.80	± 2.71	± 2.69
Indian std*_	151.5	150.9	151.5	150.9	151.5	150.9
Deficit or excess in percent	-3.78	-3.06	-3.49	-3.09	-3.49	-2.69
Weight (kg)	37.62	37.91	38.42	38.48	37.95	38.18
	± 2.14	± 1.49	± 1.43	± 1.92	± 1.31	± 1.46
ICMR std (1989)	50	50	50	50	50	50
Deficit or excess in percent	-24.76	-24.18	-23.16	-23.04	-24.1	-23.64
Weight/height (kg/cm)	0.258	0.259	0.263	0.262	0.26	0.259
	± 0.012	± 0.007	± 0.006	± 0.009	± 0.006	± 0.007
ICMR std (1989)	0.34	0.34	0.34	0.34	0.34	0.34
Deficit or excess in percent	-24.11	-23.82	-22.65	-22.94	-23.53	-23.82
BMI	17.7	17.72	18	17.74	17.78	17.77
	± 0.840	± 0.461	± 0.311	± 0.081	± 0.401	± 0.420

\* Indian Standards given by Visweswara Rao et. al. (1990 [4])

Among the three tribes adult women belonging to the age group of 20-29 years were found to have comparatively more height deficit than women of 30-39 years. Among the three tribes, khond women of 20-29 years had, more height deficit than the others.

A similar trend was found in the case of weight also among Khond women of 20-29 years. Though deficits of height were observed among women, weight deficit was more pronounced than height deficit.

Weight for height is very useful for the assessment of malnutrition among adults.[4] Though all the women exhibited, weight for height deficit, it was more

among women of Khond tribe and less among Gadaba women of 20-29 years of age.

Body Mass Index (BMI) has been proposed as a good index to assess the current forms of Malnutrition in a community.[5] The BMI was low for Khond women and higher for Gadaba women of 20-29 years.

The distribution of tribal women according to BMI is given in Table II.

**Table II: Body Mass Index of Tribal Women**

Adult women (20-39 years)							
BMI range	Forms of malnutrition	Khond (200)		Gadaba (54)		Porja (82)	
		No	Percent	No	Percent	No	Percent
18.5	Normal	19	9.5	6	11.1	3	5.3
17.0 - 18.4	Mild	164	82.0	48	88.9	52	91.2
16.0 - 16.9	Moderate	14	7.0	--	--	27	3.5
16.0	Severe	3	1.5	--	--	--	--

The extent of malnutrition as mild or Chronic Energy Deficiency, Grade I was among Porja tribe (91.2) compared to Gadaba (88.9%) and Khond (82%) women. The percentage of women belonging to normal group was found to be more in Gadaba tribe (11 % ) compared to Khond (9.5%) and Porja (5.3%) tribes.

Chronic Energy Deficiency Grade II or moderate malnutrition was prevalent more among Khond (7%) compared to Porja (3.5%) women with none among Gadaba tribe. Severe Malnutrition or Chronic Energy Deficiency Grade III was seen only among Khond women (1.5%).

Clinical examination of the women under study revealed that anaemia in the form of pallor of conjunctiva and kollonychia was found to be more among women of Khond tribe than others.

Most of the women had dry and rough-skin may be due to exposure to changing climatic conditions without a proper dwelling place. Angular stomatitis, raw and glazed tongue were found more among women of Khond tribe might be due to inadequate consumption of milk, eggs, fleshy foods and consumption of

excessive alcohol. Dental caries due to tobacco chewing and bleeding spongy gums due to inadequate intake of fruits were also found common among the tribal women.

Scabies, diarrhoea and dysentery were very commonly found among 15-32 per cent of adult women. Gastritis was very common among women of all three tribes which might be due to the excessive intake of low grade alcohol and tobacco chewing. Nearly one fourth of the tribal women were suffering from venereal diseases mainly because of the practice of polygamy among them. Skin allergies were more among women due to poisonous insect bites, wild animal bites and contact with wild plants during their, visits to forest to collect the forest product.

The mean haemoglobin levels of adult women of all the three tribes were found to be low compared to the WHO (1982) standard values i.e. 12.g/dl.

#### Mean food and nutrient intake

Mean food intake of tribal women compared with ICMR Recommended Allowances is given in Table III.

**Table III: Mean Food Intake of Tribal Women**

Foods (g)	ICMR RDA (1989)	Khond		Gadaba		Porja	
		Intake	Deficit percent	Intake	Deficit percent	Intake	Deficit percent
Cereals	440	401.0	8.9	420.0	4.6	412.0	6.4
Pulses	45	26.0	42.20	29.0	35.6	27.5	38.9
Green leafy vegetables	100	28.0	72.0	39.7	60.3	31.5	68.5
Other vegetables	40	18.5	53.8	23.8	40.5	20.5	48.8
Roots and tubers	50	23.0	54.0	25.6	48.8	24.0	52.0
Fruits	30	6.5	78.3	9.0	70.0	8.0	73.3
Fish and flesh-foods	30	19.5	35.0	21.0	30.0	21.0	30.0

Fats and oils	30	5.0	83.3	6.0	80.0	6.0	80.0
Sugar and jaggery	20	10.0	50.0	11.5	42.5	10.5	47.5

Among the various food groups the percentage deficit for cereals was found to vary from 4.6 to 8.9 revealing the comparatively satisfactory intake of cereals by the subjects. The pulse intake was found to be low among Khond with a deficit of 42 percent compared to Porja (39%) and Gadaba (36%) women. Though the tribals cultivated pulses, most of it was exchanged for staple food items which led to inadequate pulse intake.

The intake of green leafy vegetables was found to be very less among tribal women and the deficit was more among Khond (72%). Regarding the consumption of vegetables and roots and tubers the deficit was found to be more among Khond women. Even though tribals are familiar with the wild foods available in the forests, their inclusion in the diets is on the decline due to the strenuous efforts needed for searching, digging and processing these wild foods.

The consumption of fruits was found to be very less among all. With regard to fleshy foods and fish the deficit was comparatively less than the other food groups, since beef and dry fish were frequently purchased from shandy and used. Similar observations were reported by earlier researchers [7] among tribes of East Godavari District.

Inclusion of fats and oils and sugar and jaggery was very less in their diets. In general except for cereals, the intake of all the other food groups were highly inadequate in comparison with RDA given by ICMR (1981).

The mean nutrient intake of the selected tribal adult women compared with the RDA suggested by ICMR (1989) is given in Table IV.

**Table 4: Mean Nutrient Intake Among Women**

Mean Nutrient Intake Among Women							
Nutrients	ICMR RDA (1989)	Khond		Gadaba		Porja	
		Intake	Deficit percent	Intake	Deficit percent	Intake	Deficit percent

Calories (kcal)	2225	1726	22.4	1784	19.8	1738	21.9
Protein (g)	50	30.4	39.2	34.4	31.2	31.8	36.4
Calcium (mg)	400	89.3	77.7	126.8	68.3	109.3	72.7
Iron (mg)	30	15.0	50.0	20.5	31.7	18.5	38.3
β carotene (mcg)	2400	655.2	72.7	924.3	61.5	737.7	69.3
Thiamine (mg)	1.1	0.970	11.8	1.01	8.2	0.995	9.6
Riboflavin (mg)	1.3	0.905	30.4	0.948	27.1	0.931	28.4
Niacin (mg)	14	11.8	15.7	13.5	3.6	12.6	10.0
Ascorbic acid (mg)	40	19.8	50.5	21.5	46.3	20.6	48.5

The percentage calorie deficit was found to be more among adult women belonging to Khond (22.4) tribe compared to Gadaba (19.8) and Porja (21.9) tribes. The calorie gap observed in the present study might be mainly due to the low calorie density of their diets, which are largely in the form of gruel and also due to the use of negligible amount of fat in their diets.

The protein deficit was found to be more among Khond (39.2 per cent) women. The protein was mostly derived from cereals and millets and to a lesser extent from flesh foods. Calcium deficit was found to be more among the diets of all women and could be attributed to thin low intake of greens and milk and milk products.

Iron intake, was very low among Khond women (50%) followed by others. Intake of beta carotene was also very low in their diets. Regarding the intake of B complex vitamins, riboflavin deficit was more compared to niacin. Inadequate consumption of foods rich in riboflavin like milk, eggs and flesh foods, is the reason for the wide gap between intake and requirements of riboflavin. In spite of living in close proximity to nature, the intake of vitamin C was found to be more deficient among all the tribal women.

Various studies on tribal population of India revealed that their diets are nutritionally deficient.[7] Among the three tribes studied, Khond women were found to have more nutritionally deficient diets than Porja and Gadaba women.



## Summary and Conclusion

The findings revealed that the tribal women were living in a state of great deprivation due to poor socio-economic status. Anthropometric measurements showed that the weight deficits were maximum compared to height. BMI values indicated higher prevalence of mild forms of malnutrition. Pallor of the conjunctiva, dry, rough skin, angular stomatitis, raw and glazed tongue were the common clinical symptoms among them. The mean haemoglobin values were low compared to WHO standards. The food and nutrient intake of the subjects were inadequate when compared with ICMR allowances. In general, all of them particularly the women of the Khond tribe were found to have a poor nutritional status.

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