

## Nutritional Status and Dietary Pattern of Adult Rural Population of Jodhpur District in Different Farm Categories

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**Abstract:** People in desert habitually eat what they grow on their fields. Low or marginal production from land, due to adverse climatic conditions in deserts causes under-nutrition of various forms in all segments of population. Human health is severely affected due to recurring droughts and continued food scarcity. Present study was conducted in four villages viz., Basni Kharia and Gajsinghpura in Bhopalgarh Panchayat Samiti; & Chaba and Tibna in Shergarh Panchayat Samiti of Jodhpur district, with a view to understand farm category differences in nutritional status and dietary pattern of adult rural population. The families of village were classified into three categories based on land holding criteria. In all 123 adults (64 males and 59 females) were considered for detail study. Dietary records and nutritional anthropometry namely height and weight were recorded using standard techniques. Blood haemoglobin was estimated for adult females. The data was analyzed and compared for gender differences using two tailed t test of significance. Overall 66.7% male and 55.4% female population were found normal, as per body mass index (BMI) assessment. Haemoglobin level in adult female showed that 11.1% population was severely affected by Anaemia, 48.9% had moderate and 33.3% had mild degree Anaemia, only 6.6% population was found normal as per standard value. In small and large category male and female there was significant difference at 1% level of significance, in the intake of all nutrients, except carbohydrate intake in female, which was significant at 5% level of significance.

**Key Words:** Gender differences, Malnutrition, Drought, Climate, Anaemia.

### INTRODUCTION

Desert lands are characterised by frequent droughts that results in crop failure and consequent food scarcity for human and livestock population. Often drought continues for 2-3 years leading to miserability to human and livestock population (Singh Gaj Presidential address, 2002). Human health is severely affected due to droughts and continued food scarcity spread over the years. People in desert habitually eat what they grow on their fields, but adverse climatic conditions in desert lead to low to marginal production from land which in turn causes malnutrition of various forms in all segments of population (Dayal and Gulati, 1993). Women are especially vulnerable in this region as they have to do hard work in home & farm and also

bear and rear children. Pregnancy and lactation demands extra amount of food for a period of 3-4 years continuously (Acharya, 2003). For most women in the underdeveloped countries pregnancy and lactation are amongst the most stressful periods when she sustains a rapidly growing foetus often under hostile conditions of poverty and overwork. (Bamji SM et al, 1999). Thus malnutrition, which sets in one generation, continues for several generations (Tewari et al. 2015) Therefore, maternal factors become especially important for the health of population in arid zone. Gender differences in consumption exist primarily due to prevailing traditions in society. Lower availability of food and low purchasing power compels women to eat last and least throughout their lives. This paper

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examines importance of health of adult male and female population in rural areas while carefully analysing whether gender wise any significant difference exists in the different farm category population of arid Rajasthan. A primary baseline cross sectional survey was done in four villages of Jodhpur district on dietary records and nutritional anthropometry.

## METHODOLOGY

The study involved four villages of Jodhpur district in two panchayat samities namely Bhopalgarh and Shergarh. In Bhopalgarh panchayat samiti village, Basni Kharia and Gajsinghpura were selected and in Shergarh panchayat samiti Chaba and Tibna villages were selected. All the villages were 60-70 km away from urban area of the district. The families of village were classified into three economic classes based on land holding criteria. Marginal category farmers were considered in the low-income group having no or less than one ha unirrigated land. The small category farmers were considered in the middle-income group having 1-2.5 ha unirrigated land. The large category farmers were considered in the high-income group having unirrigated land more than 2.5 ha (Sanadhya, et.al.2001). From the each identified group in each village minimum four households were selected based on snowball sampling method and all adult male and female were considered in the study. In all 123 adults were considered 64 males and 59 females. Dietary records and nutritional anthropometry viz. height and weight were recorded using standard techniques. Blood haemoglobin was estimated for adult female.

The data was analyzed and compared for gender differences using two tailed t test of significance.

## FINDINGS

### Chronic Energy Deficiency

Body mass index was calculated to assess chronic energy deficiencies (CED) in population. It was found that 5.6% marginal category male population had CED-III, no other category male had CED-III. CED-II was prevalent in 5.6% small category male population. CED-II was found prevalent in 6.1% female marginal population. In overall population 66.7% male and 55.4% female population was found normal. The findings of our study support a view that targeting female population in nutrition intervention is more important (Coonrod, 1998). (Table 1).

### Prevalence of Anaemia

Haemoglobin level in adult female showed that 11.1% population was severely affected by anemia, 48.9% had moderate degree anemia and 33.3% had mild form of anemia, only 6.6% population was found normal. The finding of the study suggests that due to regular occurrence of drought vis-à-vis food scarcity conditions in arid region, the diets of people are grossly deficient in protective foods like green leafy vegetables, other vegetables and fruits. Deficiency of protective foods reduces bioavailability of other nutrients because vegetables and fruits are an essential source of micronutrients that are required for metabolism (Table 2).

**Table 1**  
Percentage Prevalence of Malnutrition in Adult human population of Jodhpur District based on Body Mass Index

BMI Class	Presumptive Diagnosis	Marginal		Small		Large	
		Male	Female	Male	Female	Male	Female
< 16.0	CED -grade III	5.6	-	-	-	-	-
16.0-17.0	CED -grade II	-	6.1	5.6	-	-	-
17.0-18.5	CED -grade I	11.1	4.1	11.1	8.2	-	4.1
18.5-20.0	Low weight - Normal	16.7	10.2	11.1	10.2	-	8.2
20.0-25.0	Normal	11.1	12.2	16.7	12.2	11.1	16.3
25.0-30.0	Obese grade I	-	-	-	2	-	6.1

CED: Chronic Energy Deficiency

**Table 2: Percentage Hemoglobin level in Adult Female population of Jodhpur District**

Category of Anaemia	Hemoglobin Level	Marginal	Small	Large
Severe	< 8.0	6.7	2.2	2.2
Moderate	8.0 - 9.9	20	13.3	15.6
Mild	10.0 - 11.9	6.7	13.3	13.3
Normal	>12.0	-	4.4	2.2

**Dietary Pattern**

The general dietary pattern was found cereal based plain diets with or without curds/dhal. Mean protein intake ranged from 55.27 to 117.87 gm in the adult population. Two tailed t test was applied between the protein intake of male and female population, no significant difference was found, which suggest that intake of protein in male and female is almost comparable (Edmundson & Edmundson ,1988). The major source of protein was through cereals, like wheat and pearl millet. Mean fat intake did not statistically differ between male and female adult population. The visible source of fat in the form of ghee and oil was negligible however, the

invisible fat derived from cereal constituted the major portion.

There was no significant difference in the carbohydrate intake of male and female population in different economic classes. The chief source of carbohydrate was cereals and millets. The mean energy intake ranges from 1600 Kcal to 3486 Kcal per day in female population and mean energy intake of male population was 1962 Kcal to 3660 Kcal per day. There was no significant difference in the energy intake of male and female population. Calcium and Iron are two important minerals in human diet, deficiency of which may lead to bone deformity and anemia respectively. However, population had low hemoglobin level but gender differences were not significant. Carotene is required for good ocular functioning (Batliwala ,1987). The important sources of carotene are green leafy vegetables and yellow fruits. There was no significant gender difference in intake of carotene though it was found less than 50% of RDA.

The results revealed that there was significant difference at 1% level of significance in fat, calcium

**Table 3  
Mean Intake of Nutrients in Jodhpur district**

Nutrients	Sex	Marginal	Small	Large	t value		
		Mean ± SD	Mean± SD	Mean± SD	Marginal/ Small	Marginal/ Large	Small/ Large
Protein (g)	F	80.88 ± 30.57	81.80±36.49	93.35±31.24	1.45 <sup>NS</sup>	5.77**	4.55**
	M	87.80 ± 33.65	85.37±30.19	106.70±44.96	1.06 <sup>NS</sup>	3.55**	5.15**
Fat (g)	F	30.25 ±16.24	45.89±30.39	62.05±34.82	3.49**	8.32**	4.11**
	M	32.46±15.79	41.72±16.59	66.55±44.06	2.36*	3.94**	2.91**
Carbohydrate (g)	F	467.72±176.81	460.19±215.41	517.48±170.49	2.85**	6.89**	2.43*
	M	509.58±198.15	469.28±177.61	598.71±241.74	1.08 <sup>NS</sup>	3.76**	3.18**
Energy (Kcal)	F	2461.7±960.67	2520.22±1176.61	2976.96±1008.94	2.02 <sup>NS</sup>	7.78**	3.75**
	M	2676.97±1045.17	2653.24±941.19	3423.52±1421.65	2.04 <sup>NS</sup>	4.97**	3.62**
Calcium (mg)	F	461.08±187.44	482.83±161.20	783.83±445.45	3.04**	8.96**	6.96**
	M	476.17±187.98	483.70±152.94	865.10±510.60	8.81**	7.37**	6.75**
Iron (mg)	F	41.99±22.10	39.33±26.48	39.37±14.45	0.72 <sup>NS</sup>	2.59*	3.54**
	M	47.82±24.97	41.90±24.48	48.55±25.71	1.97 <sup>NS</sup>	4.40**	6.00**
Carotene (µg)	F	846.63±816.82	791.18±455.71	1554.53±1283.27	15.86**	7.52**	14.37**
	M	1015.5±849.44	790.44±428.70	1620.09±1418.33	19.09**	5.49**	12.73**

F= Female, M=Male \*\* Significant at 1% level \* Significant at 5% level NS=Non-Significant

and carotene intake of marginal and small category male as well female (Dorin, 1999). However, the carbohydrate intake was significant in marginal and small category female only. In marginal and large category male and female there was significant difference at 1% level of significance in the intake of all nutrients except iron intake in female, which was significant at 5% level of significance. In small and large category male and female there was significant difference at 1% level of significance in the intake of all nutrients except carbohydrate intake in female, which was significant at 5% level of significance.

Food self-sufficiency or food security is usually measured in terms of cereals and calories. Although assessments by conventional macro measures show considerable improvements in food security in India, the levels of cereal consumption and calorie intake of even the general population are still below the normal threshold limits (Suryanarayana, 1997). It is demonstrated that there is a much more severe deficiency of fats (and of calories) than that of carbohydrates and proteins, especially in rural India (Dorin, 1999).

Despite the fact that India is producing enough food grains to sustain its entire population, the poor in India often do not have enough to eat (Abusaleh et. al.1999). Therefore, in order to increase nutritional standards, appropriate education for growing balanced food must be provided (Kermel, 1989). Social organizations at the village level should be used as centres for adult nutrition education programmes including childcare.

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