

## **Assessment of Nutritional Status of Women in Rural Areas of Bengaluru District.**

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**Abstract:** The study was undertaken on nutritional status of rural women with the sample size of 200 respondents. Nutritional status reflects the health of a person and is influenced by the quality of foods eaten. Mean anthropometric measurement of rural women were 153.8 cm of height, 46.8 kg of weight. On comparison with the mean BMI standards, it was observed that 20 per cent of women were under nourished, 64 per cent of women were normal and 16 per cent women were obese. On comparison with the mean waist/hip ratio with standards, it was observed that 84 per cent were in normal category and 16 per cent were obese. Education, land holding, income and age had significant positive association with anthropometric measurements of rural women. The deficient level of hemoglobin existed in 53 per cent of rural women. The occurrence of morbidity symptoms was higher in rural women.

**Key words:** Anthropometry, Body Mass index, Hemoglobin, Nutrient deficiency, Rural women

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### **I. Introduction**

According to 2011 census the population of women in Karnataka was 38 million and out of these 28 million women belongs to rural area. Populations like rural agricultural labourers and tribal community are more vulnerable than the rest of the population in India. Nutritional status reflects the health of a person and is influenced by the quality of foods eaten and the ability of the body to utilize these foods. It is affected by various socio-economic factors including income, family size, occupation and educational status of the people. Musbe and Kumar, (2002) studied the prevalence of symptoms of malnutrition in a community is in turn a reflection of dietary consumption of its members. Majority of the population in developing and underdeveloped countries suffer from malnutrition and mostly the axe falls on the women and children. Keeping these facts in view, the study was conducted with objectives, to assess the anthropometric measurements of the rural women and to assess the hemoglobin, morbidity and nutrition deficiency symptoms of rural women.

### **II. Material And Methods**

The nutritional status of subjects was assessed by nutritional anthropometry, diet survey and hemoglobin level. The anthropometric measurements *viz.*, height in cm, weight in kg, waist and hip circumference of the respondents were recorded. The nutritional status was assessed by calculating BMI (Body Mass Index) and WH ratio (Waist to hip ratio). Height was measured accurately to the nearest 0.1 cm using vertical rod. The subject were made to remove the shoes and stand on the height rod platform by the scale with foot parallel with heels, shoulders and back of head in upright posture. Weights of the selected subjects were measured to the nearest point of 0.1 kg using a standard weighing balance (Jelliffe, 1966). The accuracy of the weight was ascertained by using standard weight. Height and weight of the subjects were used to calculate the body mass index. The subjects classified based on standard BMI (NIN, 1999). Waist circumference and hip circumference were used to calculate the waist to hip ratio. The abdominal obesity was judged by using the reference ratio given by (Lean *et al.*, 1995). Clinical status was assessed by the investigator by visual method (presence of any deficiency symptoms at the time of survey). Modified ICMR proforma was used for the same. Morbidity status of the subjects was assessed by orally enquiring from the subjects whether they suffered from past six months any of the disorders mention in the Performa. Hemoglobin status is an indicator of iron status in an individual. The occurrence of iron as a component of the hemoglobin molecule has led to the use of hemoglobin determination to assess the adequacy of iron allowance.

### III. Results And Discussion

Table 1 depicts the mean anthropometric measurement of the SHG rural women. The mean height of SHG rural women was 153.8 cms, and the mean weight women 46.8 kgs. The average body mass index was 22.49 and the mean waist hip ratio 0.80. According to body mass index women were categorized into normal, underweight and overweight (Fig.1 A). Sixty four per cent of respondents were normal followed by underweight (20 %) and 16 per cent respondents were overweight. Similar findings has been observed by Venkatalakshmi and Peramma, (2000) who reported that body mass index of agricultural farm women showed lower weight of normal grade (18.5-20.0). Also concluded that agriculture workers are main pillars of the country's economy and lower body weight decreases the productivity. Since the rural women belong to low socio-economic group in general, the reasons for prevalence of under nutrition could be due to the fact that women are over exhausted by the combination of reproductive demands and long term intake of lower amounts of food.

The waist/hip ratio of the rural women was also depicted in the (Fig 1.B). Among respondents 84 per cent of them were normal and 16 per cent of them were overweight. Estimates of waist/hip ratio provide a useful indication of nutritional status of underdeveloped countries, where population is often malnourished with little fat reserves, a change in this measurement reflects the total body stress. It is observed that measurement of waist/hip ratio has been used as a measure of total body subcutaneous fat. This observation was in concurrence with the findings of Menon *et al.* (2011) who reported that body weight was highest in older individuals, whereas no marked difference was observed in other variables like height. The possible factors of variation in waist/hip ratio, height and significant linear correlation with weight. Approximately 50 per cent of the women were under nourished due to low intake of food during early childhood and socio-economic status.

Correlation co-efficient of selected socio-economic factors on anthropometric measurements of women are depicted in Table 2. It is indicated that, except age with height and waist/hip ratio, family type with weight, height and BMI, remaining independent variables had positive relationship with anthropometric measurement. Education, land holding and income had a complete positive influence on anthropometric measurements and same results could be observed with respect to dietary intake also. From the present study it was observed that socio-economic factors viz. age and family income had a positive influence on anthropometric measurements. These observations are in line with the findings of Shwetha *et al.* (2011).

Table 3 shows the classification of rural women by hemoglobin range. The deficient level of hemoglobin existed in 53 per cent of women, low in 20 per cent and 27 per cent of women had acceptable level. This may be due to inadequacy of iron through dietary intake, which in turn affects the women as undernourished. Poor nutrition also affects her activity level and overall physical performance which reduce work capacity, increases fatigue and causes nutritional anemia. These findings are in line with the findings of Shobha *et al.* (2011) who reported that mean hemoglobin levels of women was 10.44 g/dl. Majority of women (59.21%) were mild anemic, 23.3 per cent were moderately anemic and only 14.5 per cent were found to have normal hemoglobin level.

The occurrence of the illness among women is presented in Table 4. The illness reported among women in the study were pain in hands and legs, backache, headache, pain in abdomen, fever, weakness, cold and cough and acidity. This may be due to considerable amount of work load on women who spend 8 to 9 hours at work and after returning continue their day's work at home also. This was in conformity with findings of Jain and Singh (2013) who reported that more than three fourths of the farm women were frequently victimized for the health hazards namely skin irritation (88%), headache (80%), hardness of hand and feet (76%), back/body ache (74%) and whooping cough (60%) as a result of their involvement in agricultural occupations.

The prevalence of various nutritional deficiencies among rural women of the study group is also presented in the same Table 5. The table reveals that the incidence of anemia, dental carries and gums-spongy bleeding was present in rural women. These results indicate that the rural women consumed inadequate iron and B-complex vitamins. Similar results were reported by Jain and Singh (2013) who reported that the women laborers suffered from B-complex deficiency followed by dental carries, bleeding gums and rough skin which may be due to type of work and climate.

### IV. Conclusion

Since the rural women belong to low socio-economic group in general, the reasons for prevalence of under nutrition could be due to the fact that women are over exhausted by the combination of reproductive demands and long term intake of lower amounts of food. Education, land holding, income and age had significant positive association with anthropometric measurements of rural women. The estimation of hemoglobin was carried out by finger prick method. The deficient level of hemoglobin existed in 53 per cent of rural women, low in 20 per cent and only 27 per cent had acceptable level. The occurrence of morbidity

symptoms was higher in rural women. Such as pain in hands and legs, cold and acidity. Majority of the rural women were anemic, but some of the nutritional deficiency symptoms like dental carries and gums-spongy bleeding were observed.

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**Table -1: Mean Anthropometric measurements of the rural women (n= 200)**

Attributes	Women	
	Mean	SD
Height (cm)	153.8	4.9
Weight (kg)	46.8	5.0
BMI	22.49	10.19
Waist hip ratio	0.80	0.268

**Table -2: Correlation co-efficient of Independent variables on Anthropometric measurements**

Independent variables	Correlation co-efficient (r)					
	Weight (kg)	Height (cm)	BMI	Waist	Hip	Waist/hip ratio
Age	0.00569 <sup>NS</sup>	-0.21068 <sup>*</sup>	0.00578 <sup>NS</sup>	0.04548 <sup>NS</sup>	0.01115 <sup>NS</sup>	-0.014 <sup>NS</sup>
Family type	-0.031213 <sup>NS</sup>	-0.02684 <sup>NS</sup>	-0.1079 <sup>NS</sup>	0.2206 <sup>*</sup>	0.21784 <sup>*</sup>	0.0194 <sup>NS</sup>
Family size	0.016824	-0.11652 <sup>NS</sup>	-0.0097 <sup>NS</sup>	0.30921 <sup>**</sup>	0.27853 <sup>**</sup>	0.04869 <sup>NS</sup>
Education	0.0153642	0.23298 <sup>*</sup>	0.13003 <sup>NS</sup>	0.1206 <sup>NS</sup>	0.1346 <sup>NS</sup>	0.11343 <sup>NS</sup>
Land holding	0.1976 <sup>*</sup>	0.17289 <sup>NS</sup>	0.18321 <sup>NS</sup>	0.19609 <sup>*</sup>	0.20659 <sup>*</sup>	0.11967 <sup>NS</sup>
Income	0.426136 <sup>*</sup>	0.39847 <sup>**</sup>	0.38279 <sup>**</sup>	0.3903 <sup>**</sup>	0.40509 <sup>**</sup>	0.35767 <sup>**</sup>

\* Significant at 5%, \*\* Significant at 1% , NS: Non significant

**Table- 3: Classifications of women by hemoglobin range (n = 200)**

Hemoglobin classification (WHO standard)	Respondents	Per cent	SD
Deficient (<10g/dl)	106	53	1.680
Low (10-11.9 g/dl)	40	20	1.560
Acceptable (>12 g/dl)	54	27	1.580
<b>Total</b>	<b>200</b>	<b>100</b>	

**Table-4: Morbidity status of rural women**

Sl. No.	Symptoms	Respondents (n=200)	
		No.	Per cent
1.	Pain in hands and legs	67	33.50
2.	Giddiness and darkness in front of eyes	48	24.00
3.	Back ache	40	20.00
4.	Head ache	120	60.00
5.	Fatigue	40	20.00
6.	Body ache	46	23.00
7.	Fever	48	24.00
8.	Breathlessness	12	6.00
9.	Weakness	19	9.50
10.	Eye strain	45	22.50
11.	Cold	67	33.50
12.	Cough	12	6.00
13.	Acidity	47	23.50

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14.	Tooth pain	12	6.00
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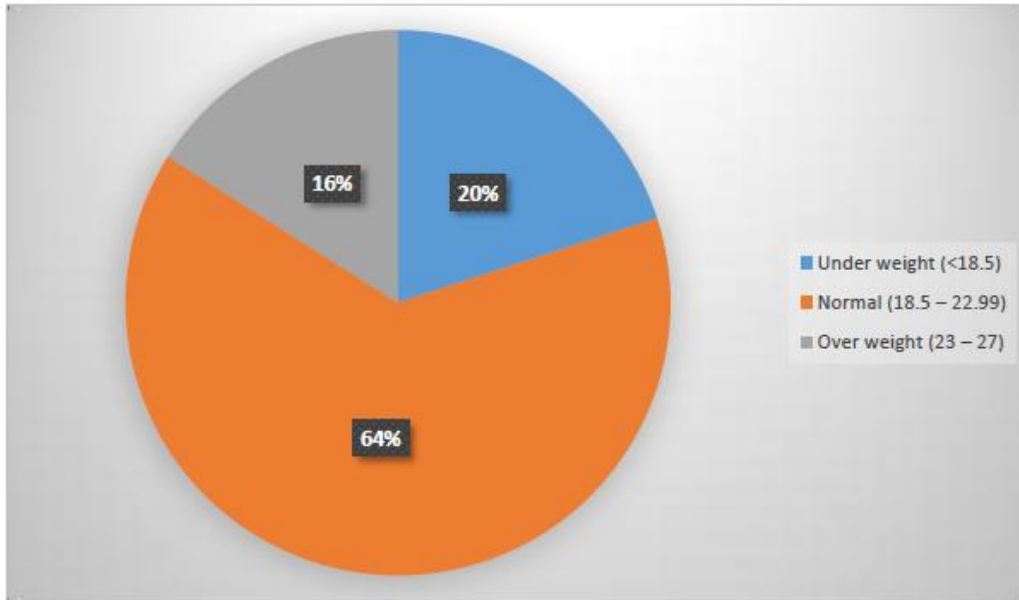
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**Table-5:** Nutrient deficiency signs prevalent in rural women

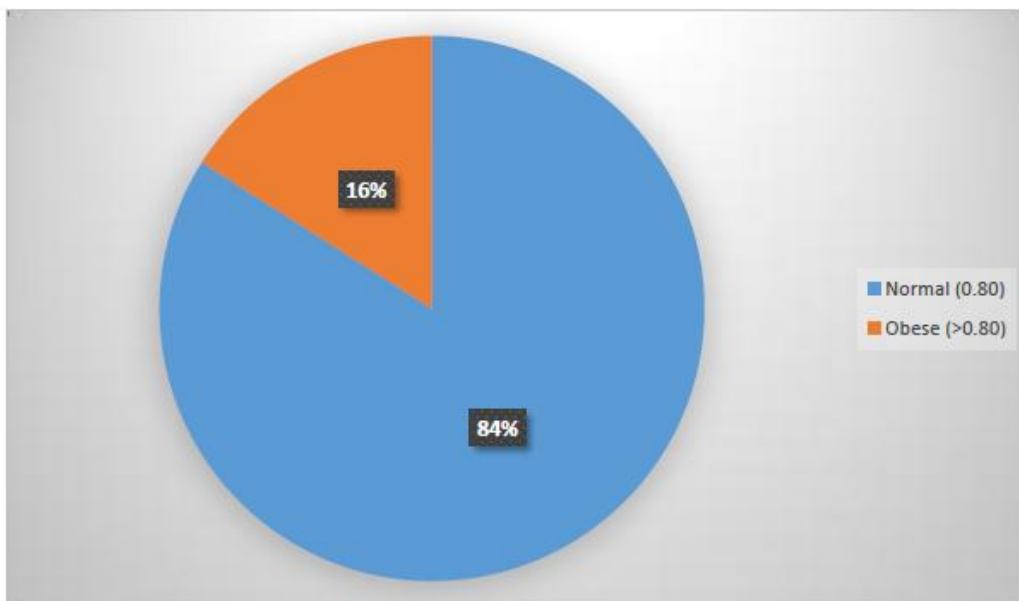
Clinical symptoms	Respondents (n=200)	
	No.	Per cent
Anaemia	124	62.00
Dental caries	31	15.50
Mottled enamel	12	6.00
Gum spongy bleeding	6	3.00
Normal	17	8.50

@ Multiple response

**(A)**



**(B)**



**Fig 1 (A) Body Mass Index and (B)Waist to Hip ratio of rural women**