Role of Socio-Economic Factors in the Dietary Pattern and Nutritional Deficiencies in Rural Women of Shimla District–An Empirical Study

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Abstract—*Diet and nutrition are important factors in the promotion and maintenance of good health. Income, prices, individual preferences, cultural traditions, social and economic factors all interact in a complex manner to shape dietary consumption patterns. At times during the year, there is uncertainty of having, or unable to acquire, enough food for all household members due to insufficient money and lack of other resources for procuring food. This is the most serious nutrition related public health problem facing India today. Women living in food insecure households are at increased risk for a wide range of negative health outcomes due to malnutrition. A normal balanced diet must include daily foods from the various food groups in sufficient amounts to meet the needs of an individual. The paper deals with assessing the nutritional adequacy of the dietary pattern of the rural women and the deficiencies associated with low economic status. The diets of the women were mainly based on cereals and were deficient in vegetables and fruits. The low intake of these protective foods resulted in nutritional disorders. Promoting healthy diets and lifestyles, improving the socio-economic status can help in reducing the burden of malnutrition and non communicable diseases which requires a multisectorial approach.*

Keywords*: Malnutrition, anaemia, socio-economic status, anthropometric measurements, clinical symptoms.*

1. INTRODUCTION

Diet and nutrition are important factors in the promotion and maintenance of good health. The health and nutritional status of rural women who form the vulnerable group of India's population is far from satisfactory. In the rural areas of Shimla, they work as homemakers, farmers, food providers, fuel gatherers and animal feeders. Diets evolve over time, being influenced by many factors and complex social interactions. Income, prices, individual preferences and beliefs, cultural traditions as well as environmental, social and economic factors, all interact in a complex manner to shape dietary consumption patterns.

The results of various surveys reveal that the diets of rural women are mainly based on cereals and are deficient in vegetables and fruits. The low intake of these protective foods results in nutritional deficiencies. Keeping this in mind, the present study was undertaken with the following objectives:

- To find out the anthropometric measurements consisting of weight, height and B.M.I
- To determine and compare the nutrient intake with the Recommended dietary allowances
- To examine the clinical signs and symptoms of nutritional deficiencies.
- To assess the blood parameters of the rural women.

2. LOCALE OF THE STUDY

The study was conducted in the villages of Malliana, Pujrali, Badagaon, Kiari of Shimla district in the state of Himachal Pradesh.

3. MATERIAL & METHODS

A well structured interview schedule was developed considering the specific objectives of the study. A sample of 500 rural women in the age group of 20-35 years was randomly selected for the study from the four villages. The food consumption of the subjects was recorded by 24-hour recall method for three consecutive days. The cooked dishes were converted into raw foods with the help of *katories* to facilitate the calculation of nutrients in the diets. From the actual consumption of foods daily by the respondents, the energy, proteins, iron, calcium, vitamin A (Retinol), thiamine, riboflavin, niacin and ascorbic acid content was calculated using food composition tables. The percentage adequacy of the diets was also calculated. Body mass index was calculated using the formula given by **Wyngaarden**, as cited in **Srilaxmi** (2002).

$$\text{B.M.I} = \frac{\text{Weight (Kg.)}}{\text{Height in metres}^2}$$

The blood samples of the respondents were checked for haemoglobin by cyan methaemoglobin method of **Dacie and**

Lewis (1966) and Packed Cell Volume (PCV) by **Hunter and Bomford** (1967). The results were statistically analyzed. The morbidity symptoms and the information regarding the illness suffered by the women since past three months were noted down. All the women were clinically examined using the ICMR schedule. The presence or absence of the clinical deficiency symptoms was recorded.

4. RESULTS & DISCUSSION

The results obtained of the study are as follows:

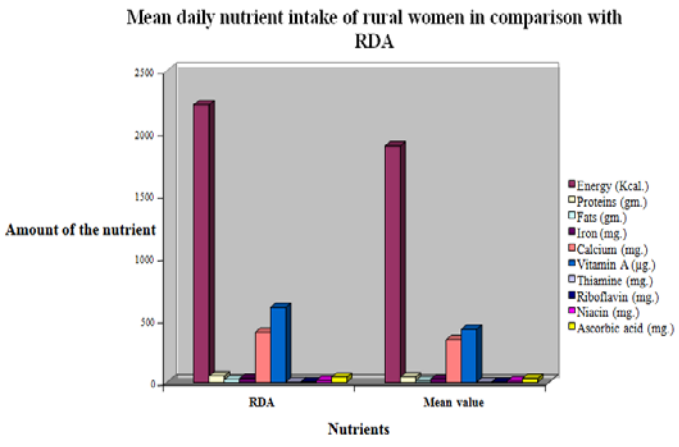
5. DIETARY INTAKE

Nutritional status is usually influenced by a large number of factors. One of the important factors is food consumption. The diet of rural women was monotonous and lacking in variety. They were more concerned about the quantity than quality of the diet. The common menu was cereal for breakfast and rice with dal or vegetable for dinner. The average daily intake of nutrients by the rural women is presented in **Table 1**.

Table 1: Mean daily nutrient Intake of rural women in comparison with RDA

Nutrient	RDA	Mean Value ±S.D	% Diet Adequacy
Energy (Kcal.)	2225	1894 ± 241	117.47
Proteins (gm.)	50	41 ± 3.69	121.95
Fats (gm.)	20	11.4 ± 1.15	175.40
Iron (mg.)	30	23 ± 1.99	130.43
Calcium (mg.)	400	342 ± 31.0	116.95
Vitamin A (µg.)	600	425 ± 51.3	141.17
Thiamine (mg.)	1.1	0.6 ± 0.1	183.33
Riboflavin (mg.)	1.3	0.7 ± 0.2	185.71
Niacin (mg.)	14	9.3 ± 1.03	150.53
Ascorbic acid (mg.)	40	30 ± 5.6	66.66

Mean daily nutrient intake of rural women in comparison with RDA



The adequacy of nutrients was below the RDA's for all the nutrients. The mean daily energy and protein intake by the respondents was 117.47 and 121.95% adequate as compared to the RDA (**ICMR**, 1990). The mean daily intake of iron intake among the subjects was 23 mg. which was130.43% of the RDA for iron. The low iron intake was due to insufficient intake of green vegetables, absence of sprouts. The mean values of thiamine, riboflavin, niacin in the daily diets of the respondents were inadequate as compared to the RDA's. This has also been reported by **Oyarzun & Sanjur** (1993). The intake of Vitamin C with the mean value being 30 mg. was less as compared to the RDA. A low consumption of Vitamin C among women of low income has also been reported by **Gibney & Lee** (1993).

6. ANTHROPOMETRIC MEASUREMENTS

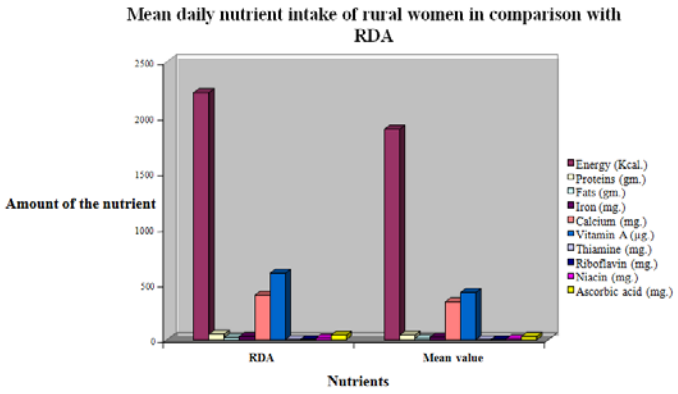
The average weight and height of the subjects is shown in **Table 2**. The average weight of the rural women ranged from 35 to 55 kg. whereas the range of height was from 115 to 150 cm.

Table 2: Anthropometric measurements of the rural women

Parameters	Mean value	Normal value
Weight (Kg.)	40 ± 1.8	50*
Height (cm.)	141 ± 7.9	156*
B.M.I	16 ± 0.8	18-23**

***ICMR**, 1990

**** Srilaxmi**, 2002



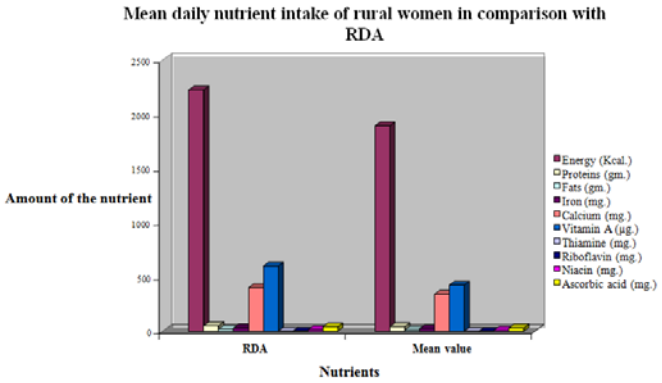
The results showed that the rural women were of less height, weight and B.M.I than the normal values. The low B.M.I was an indicator of malnutrition among the rural women.

7. MORBIDITY & CLINICAL SYMPTOMS

Table 3: Existing illnesses and other clinical symptoms

S. No.	Symptoms	Number of subjects (N=500)	%	Rank
1.	Cold	98	19.6	5

2.	Cough	107	21.4	4
3.	Diarrhoea	43	8.6	7
3.	Fever	65	13.0	6
4.	Headache	119	23.8	3
5.	Pain in hands & legs	150	30	2
6.	Backache	202	40.4	1



The illnesses and other clinical symptoms reported among this study were backache, headache, pain in the legs and hands, diarrhea and fever as shown in **Table 3**. This may be due to the considerable workload for women who spent 8-9 hours at work, continued their work at home also and consumed less food. This led to dietary inadequacies.

Anaemia was rampant as shown in **Table 4**. Clinical symptoms of anaemia such as paleness of conjunctiva and skin, pale and smooth tongue, koilonychia (flat and spoon shaped nails) and fatigue were observed among the rural women. 82% of the respondents complained of lethargy. Symptoms of other nutritional deficiency diseases such as pale eyes, scarlet raw tongue, angular stomatitis, cheilosis, mottled enamel, dental caries, phrynoderma, scurvy were observed among the rural women as shown in **Table 5**.

Table 4: Clinical symptoms of Anaemia among rural women

Symptoms	Number of subjects (N=500)	%
Pale conjunctiva	218	43.6
Paleness of skin	106	21.2
Pale & smooth tongue	76	15.2
Koilonychia	297	59.4
Feeling of lethargy	410	82

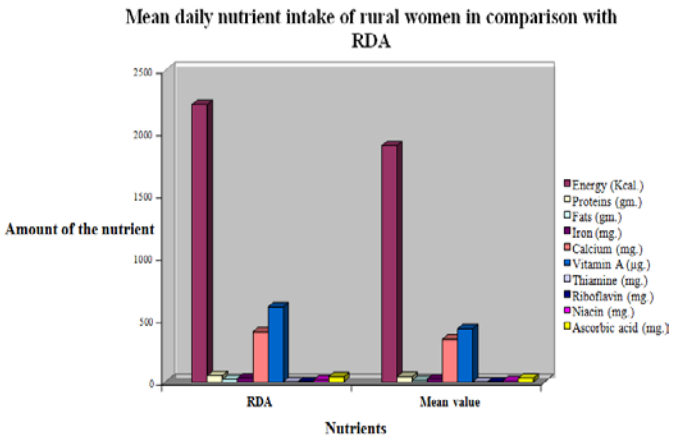
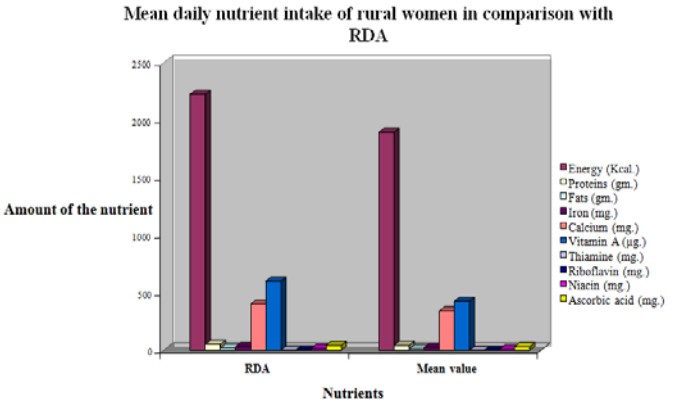


Table 5: Clinical symptoms of other nutritional deficiencies among rural women

Symptoms	Number of subjects (N=500)	%
Pale eyes	10	2
Scarlet raw tongue	25	5
Angular stomatitis	43	8.6
Cheilosis	52	10.4
Mottled Enamel	103	20.6
Dental caries	291	58.2
Phrynoderma	8	1.6
Scurvy	38	7.6

Data showed that 58.2% rural women had dental caries. Mottled enamel was observed in 20.6% subjects. The symptoms of B-complex vitamin deficiencies like scarlet raw tongue, angular stomatitis, cheilosis were present in some women though the number of subjects who were suffering from these deficiencies was not high. Bleeding gums, loose teeth which are the characteristic symptoms of scurvy were present in 7.6% respondents.



Gangadharappa *et al* (2003) found the common deficiency signs and symptoms of B-complex vitamins among adult women in South India. The results of the present study indicate that the rural women consumed inadequate amounts of iron, calcium, B-complex vitamins and vitamin C.

8. BLOOD PARAMETERS

The blood haemoglobin (Hb) level, packed cell volume (PCV) and mean corpuscular haemoglobin concentration (MCHC) values ranged from 7-12gm./dl, 25-42% and 22-37% respectively. The mean Hb value of 9.8 gm./dl and of MCHC 28% were below normal limit confirming the presence of iron deficiency anaemia as shown in **Table 6**. However the average value of PCV which was 36.7% obtained in the present study lies within the normal range. According to WHO (1970), the percentage prevalence of anaemia was 83% and only 17% of the subjects had normal level of haemoglobin.

Table 6: Blood Parameters of the rural women

Blood Parameters	Mean ± S.D	Normal value
Haemoglobin	9.8 ± 0.4	12.0*
Packed Cell Volume %	36.7 ± 0.8	32-38**
Mean Corpuscular Haemoglobin Concentration %	28 ± 0.2	32-38**

* WHO (1970)
** Hunter & Bomford (1967)

9. CONCLUSION

The present study revealed that most of the rural women in villages had education only till the primary level. They were ignorant about personal hygiene and cleanliness of the surroundings. The consumption of milk and milk products, vegetables and fruits was much less than the RDA proposed by ICMR (1990). The body weight, height and B.M.I of the rural women were below normal. There were clinical signs and symptoms of anaemia, B-complex vitamin deficiencies. The dietary inadequacy of iron seemed to be the main causative factor of anaemia. The rural women are a vulnerable section of the society. They suffer from various health problems. Promoting healthy diets and lifestyles to reduce malnutrition and non-communicable diseases requires a multisectorial approach. The strategies must not only be directed at ensuring food security for all but the rural women must be encouraged to consume adequate quantities of safe and good quality foods. Nothing short of radical change will help in raising the health and nutritional status of the rural women.

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