

HEALTH AND NUTRITIONAL STATUS OF HILL FARM WOMEN OF KANGRA DISTRICT, HIMACHAL PRADESH

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Abstract: Women are the major work force in Himachal Pradesh and play a significant role in agriculture and other allied activities. Health and nutritional status of sixty hill farm women performing agricultural and allied activities regularly were selected from three blocks of Kangra District for the investigation. Majority of selected farm women were in age group of 36-55 years and belonged to farm families having medium (43.33%) to small (41.66%) land holdings. Mean height and weight of respondents was recorded below standards when compared at national level. Categorization of BMI suggested that 63.33% of them were underweight (BMI <18.5) with 25% having mild thinness (17.00-18.49), 20% having moderate thinness (14.00-16.99) and 18.33 % having severe thinness (<14.00). Only 30% had normal nutrition (BMI-18.50-24.99). Physical fitness rating showed that 28.33% had high average rating followed by 25% having poor fitness and 21.66% had low average fitness.

Assessment of nutritional deficiencies of selected farm women through clinical assessment revealed that majority of the respondents showed deficiency of iron and thiamine. Signs and symptoms of anemia were very prevalent and more than 50% women exhibited iron deficiency symptoms when assessed clinically. Comparison with suggested dietary intake revealed that the women had low intake for all food groups except sugar and oils. Their diets were inadequate in energy, protein, carotene, folic acid and ascorbic acid when compared with recommended dietary allowances.

Keywords: Farm women, socio-economic profile, food intake, nutritional status, body composition, physical fitness

INTRODUCTION

A majority of women in rural India is associated directly or indirectly with agricultural production, processing and distribution. About two third of the manual labour in farming is constituted by rural women. Irrespective of their degree of affluence, they provide 14 to 18 hour of productive physical labour every day in a wide variety of activities directly connected with agriculture, allied and domestic chores. (Bellurkar, 2015).

Women are the major work force in Himachal Pradesh and play a significant role in agriculture and other allied activities. They are the veritable back-bone of subsistence agriculture because about 80% of the field work in agriculture, from sowing to harvesting, post-harvest management and dairy management is done by hill women farmers. These

women participate in extremely tedious, time consuming and labour intensive agricultural operations, viz land preparation, manuring, sowing, transplanting, weeding, hoeing, applying fertilizers, taking care of crops, harvesting and even post harvest management like shelling, cleaning, grading, storage of food grains and processing etc. The rural hill farm women are therefore involved in extensive work on fields and at household levels daily and are hence exposed to all the risks of ill health, poor nutrition and inadequate care. The women also have to undergo a very hard life due to geo-physical conditions of the hilly region. This array of work in the absence of proper nutrition and health care is bound to create serious health repercussions.

In Himachal, most of farmers are small and marginal having terraced and fragmented land holding pattern. Due to the undulating topography of region, farmers/farm women are still using traditional modes of cultivating crops. The tasks are laborious and since the woman is unaware of the latest technical know-how, her output and productivity are low. So, lack of mechanisation add burden on the shoulders of women thereby increasing the drudgery level, affecting their nutritional status and health and reducing the productivity/output. Scarcity of energy resources in rural areas and its impact on women's workload, health, nutritional status and productive capacity of women are the important areas, which have not received adequate attention from policy planners and related ministries (Kalia, 2004). Pant (2002) in a study reported that an overwhelming population of hill women was in grip of severe to moderate malnutrition. Nutritional status as well as nutritional knowledge of hill women is unsatisfactory and needs interventions (Upadhyay et al.2011).

Health is fundamental to human progress. Nutrition is closely interlinked with health. Women's health status affects their productivity and thereby their roles in society and their own development. Nutritional surveys indicate large gaps in nutritional requirements and consumption among females as compared to males. A majority of rural and tribal women suffer from anaemia which leads to low birth weight among babies (Jhamtani, 1995). Low nutritional status of woman makes her more prone to several diseases.

Considering the multiple roles of agricultural women, the present study is an attempt to assess the health and nutritional status of hill farm women involved in agricultural work as well as allied activities.

METHODOLOGY

The baseline and the advanced survey was carried out in district Kangra of Himachal Pradesh. Sixty farm women who were performing agricultural and allied activities regularly

were selected from three blocks viz. Panchrukhi, Baijnath and Bhawarna (twenty each) for the investigation. For carrying out the health and nutritional status of hill farm women, a well-structured questionnaire containing following aspects was developed. Pre-testing of questionnaire was done to make it more functional for final study. All the respondents were interviewed personally by the investigators at work spot, which enabled to get the first hand information.

1. General and Socio Economic Information

This section included the baseline profile and demographic variables of the studied population pertaining to age, family type, community, education, monthly income, pattern and size of land holding, types of agriculture and horticulture crops grown, rearing of animals etc.

2. Dietary Information and Nutrient intake

Nutritional and health status of all the selected farm women was assessed by determining the intake of foods and nutrients. So, this section of questionnaire consisted information on different dietary aspects and dietary intake of women for three consecutive days using 24 hr. recall method. For this purpose, the respondent was asked which food items she consumed the whole day, from morning-tea to after-dinner. The food consumed was converted into their raw equivalents and the average daily intake of food and nutrients was calculated by using 'Diet Cal' software. The food and nutrient intake was compared with Suggested Dietary intake and Recommended Dietary Allowances (ICMR 2010). The per cent diet and nutrient adequacy was also calculated.

3. General Health Record (Physical fitness and body composition)

Height, weight and skinfold thickness of selected respondents were measured. Height measurement was taken with the help of an anthropometric stadiometer. The body weight was taken using portable weighing balance. The harpender skin fold caliper was used to measure skin fold thickness at four body sites. On basis of these parameters, body composition, body type and body mass index were calculated to assess the health status of farm women. Body Mass Index was calculated by using the following formula and was categorised as per classification given by WHO (2004).

$$\text{Body Mass Index (kg/m}^2\text{)} = \frac{\text{Weight, kg}}{\text{Height, m}^2}$$

Blood pressure was measured with digital blood pressure monitor. Physical fitness of respondents was assessed using step-test exercise. Their resting and working heart rate while

performing the exercise was measured with heart rate monitor (polar RS 400). Physical fitness Index (PFI) was calculated by using the following formula:

$$\text{Physical Fitness Index} = \frac{\text{Duration of stepping (sec.)}}{\text{Sum of 1st, 2nd and 3rd min recovery heart rate}} \times 100$$

Aerobic Capacity was calculated by using formula as below.

$$\left(VO_2 \text{ ml/kg x min.} \right) = 0.377 \times \text{Step} - \text{stool test score (PFI)} - 12.767$$

Health status of the women as per their PFI scores and aerobic capacity were interpreted as given by Edward et al. (1973) and Anonymous (2000).

4. Assessment of Nutritional Deficiencies (Clinical Assessment)

The farm women were assessed for different nutritional deficiencies using clinical assessment method.

RESULTS AND DISCUSSION

Before assessing the health and nutritional status and compiling information on various aspects of respondents, a baseline survey of sixty selected farm women from three blocks of district Kangra was done to document their general profile in addition to recording of socio-economic indicators like land holding pattern, income, education and animals rearing pattern etc. The objective behind this, was to assess the quality of lifestyle of families and to study the influence of these demographic and socio economic factors on health and nutritional status of selected respondents.

General profile of selected farm women is presented in Table 1. Distribution of the subjects on the basis of age revealed that majority of women selected for the study were in age group of 36-55 years with mean age of 48.27 years. 20% of the farm women having age more than 55 years were still involved in agriculture and allied activities work. The remaining 11.66% respondents were in the age range of 25-35 years which reflects the lack of interest of present generation in farm work. 56.66% of respondents belonged to OBC community and had joint family system while 44.33% had nuclear families. In rural Himachal, the households live in clusters and joint family system is still prevalent in these areas. Regarding education, more than 40% of women were below matric (46.66%) followed by education upto matric level (28.33%) while 16.66% were uneducated. Only four women studied upto senior secondary level and one was graduate. Most of the families had their own house (98.33%) with mean monthly income of Rs 17,000. The economic profile of the respondents as assessed from infrastructure revealed a better economic condition in terms of owned house (98.33%) which was *semi-pucca* (45.00) and *pucca* (36.66). Only 18.33% had *kuccha* house.

The state of Himachal Pradesh has predominately rural settlement. Kangra district has considerable diversity in its physiography, land use pattern and cropping system. More than 90 per cent of total population directly or indirectly depends upon agriculture for their livelihood. As for land holding pattern, most of these farm families had medium (43.33%) to small (41.66%) land holdings. So, the production was only self sufficient for them, but not for marketing purpose. Only 3.33% has large land holding. The blocks selected in the present study falls under Palam valley region of Kangra district that comprise mid-hill sub humid zone. The agro climatic conditions of the studied area are most suitable for growing of agriculture crops as well as horticulture crops. Major rabi crops grown were wheat, potato and vegetables. During kharif season, maize, paddy, soybean and vegetables were grown. 100% of families had milch animals which were of hybrid breed, but could yield milk only 5-10 lts./day(58.33%). 35% reared other domestic animals mainly for household consumption. Dietary habits and choices play a significant role in human health. As per dietary habits, 70% farm women were vegetarian, 28.33% were non-vegetarian but consumed these foods once a month (18.33%) followed by occasional frequency (11.66%). Three square meals dominated their meal pattern.

Anthropometric examination includes body measurements such as height, weight, skinfold thickness. These are important tools in the evaluation of nutritional status of individuals or groups. Anthropometric measurements although genetically determined, are strongly influenced by nutrition and reflect the pattern of growth and physical state of individuals. They also indicate how the individual deviate from the average at various ages in body size, build and nutritional status. Farm women recorded mean height of 171.11 ± 8.51 cm and mean weight of 53.51 ± 2.66 kg which were below standards when compared at national level. Therefore, mean BMI derived from their height and weight was 18.45 ± 3.71 which was inclined towards underweight side. Further categorization of BMI in Table 6 suggested that 63.33% of them were underweight (BMI <18.5) with 25% having mild thinness (17.00-18.49), 20% having moderate thinness (14.00-16.99) and 18.33 % having severe thinness (<14.00). Only 30% had normal nutrition (BMI-18.50-24.99). A meagre percentage of 5 farm women were in overweight category and negligible in obese category. Regarding type of body structure, 71.66% were ectomorphic (slender, very thin body), 21.66% were mesomorphic (athletic body) and only 6.66% were endomorphic (fatty body, protruding abdomen). A mean blood pressure of $127.70/77.40 \pm 6.21/3.04$ was analysed in sixty farm women.

Skinfold thickness measurement is an essential method used for anthropometric assessment of body composition. Skinfold thickness measured at four sites and the body composition derived from the values revealed that the farm women had mean body density of 1.04 with mean per cent fat of 27.66 ± 1.05 . The fat weight and lean body mass of respondents was 15.00 ± 1.23 and 38.77 ± 2.34 kg respectively. Physical fitness is linked to individual's capacity to do physical activity with a reasonable degree of efficiency without under fatigue and with rapid recovery from the effect of exercise. Physical fitness index (PFI) and aerobic work capacity are considered as an essential and important parameter to evaluate the cardiac respiratory fitness. Physical fitness rating showed that 28.33% had high average rating followed by 25% having poor fitness and 21.66% had low average fitness. Only 16.66, 6.66 and 1.66% were categorized into good, very good and excellent rating of their physical endurance. Aerobic capacity (VO_2 ml/kg-15 min) measured from heart rate values depicted that 30% had high average capacity (22.6-30.0) followed by 25% having poor capacity (<15) and 21.6% having low average aerobic capacity (15-22.5).

Clinical examination is the simplest and most essential part of all nutritional surveys. There are a number of physical signs, both specific and non-specific known to be associated with the state of malnutrition. The subjects were examined from head to foot in good illumination for the presence or absence of signs/symptoms related to nutritional deficiencies. Assessment of nutritional deficiencies of selected farm women through clinical assessment revealed that majority of the respondents showed deficiency of iron and thiamine. Signs and symptoms of anemia were very prevalent and more than 50% women exhibited iron deficiency symptoms when assessed clinically. The farm women exhibited breathlessness on slight exertion (26.66%), weakness/dizziness (51.66%), poor physical development (40%), decreased physical activity (33.33%) and cold hand and feet (30%). No symptoms of iodine deficiency were present in the study group.

Apart from anthropometric assessment, nutritional status of farm women was also assessed through their diet and nutrient intake. The diet consumed by farm women consisted largely of carbohydrates usually obtained primarily from cereals viz. rice, wheat, corn etc. in the form of boiled rice, *chapaties* or *roti*. Comparison with suggested dietary intake revealed that the women had low intake for all food groups except sugar and oils. 73.87% of farm women had 243.78g of cereals/millets intake as against 330g suggested intake. More or less, similar scenario was calculated for pulses, milk and milk products, roots and tubers as well as for other vegetables group. It was discouraging to know that a very low consumption of fruits

and green leafy vegetables was reported by respondents despite their acceptability to these foods in their kitchen garden/land. Only 18.81% farm women consumed fruits daily and that too less than 1/4th of the recommended intake. Further, women were also not aware about the easy nutritional tips like supplementation, complementation, sprouting and other techniques to enhance the nutritive value of food.

Mean daily nutrient intake and per cent adequacy of nutrients of selected farm women revealed that their diets were inadequate in energy, protein, carotene, folic acid and ascorbic acid when compared with recommended dietary allowances. Average intake of energy, protein, calcium, carotene, ascorbic acid and folate by the hill farm women was 2118.76±32.65 kcal, 44.23±1.90g, 432.19±20.71mg, 222.49±44.21 µg, 22.91±2.00mg and 85.55±16.09 µg per day as against RDA of 2730 kcal, 60g, 600mg, 4800 µg, 40mg and 200 µg per day, respectively.

CONCLUSION

Health is composed of many factors and nutrition being perhaps the most important and basic among all. In the present study, it was indicated that the diets of women were nutrient deficient thereby affecting their physical work capacity leading to drudgery and health ailments. The reasons of insufficient nutritional status were lack of time, lack of awareness regarding importance of nutrition and health, over involvement in agriculture and allied chores and low self esteem of women in the village society. The women put least priority for their health and nutritional status over other family members. In Himachal, most of farmers are small and marginal having terraced and fragmented land holding pattern. Due to the undulating topography of region, farmers/farm women are still using traditional modes of cultivating crops. The tasks are laborious and since the woman is unaware of the latest technical know-how, her output and productivity are low. So, lack of mechanisation adds burden on the shoulders of women thereby increases the drudgery level, affecting their nutritional status and health and reducing the productivity/output. So, the agricultural policies and programmes need to be more nutrition-sensitive to impact the health and productivity of families.

Table 1: General profile of selected farm women

Particulars	Blocks			
	Panchrukhi (n=20)	Bajnath (n=20)	Bhawarna (n=20)	Total (N=60)
Age (years)				
25-35	2	5	0	7(11.66)
36-45	7	7	6	20(33.33)
46-55	10	4	7	21 (35.00)
>55	1	4	7	12(20.00)
Mean age	45.82	44.27	54.73	48.27
Family Type				
Joint	11	12	11	34(56.66)
Nuclear	9	8	9	26(44.33)
Religion				
Hindu	20	19	20	59(98.33)
Sikh	0	1	0	1(1.66)
Community				
General	0	3	5	8(13.33)
OBC	10	12	12	34(56.66)
ST	6	4	2	12(20.00)
SC	4	1	1	6(10.00)
Education				
Illiterate	3	4	3	10(16.66)
Below matric	11	7	10	28(46.66)
Matric	5	7	5	17(28.33)
Senior secondary	1	2	1	4(6.66)
Graduate	-	-	1	1(1.66)
Postgraduate	-	-	-	-
Diploma	-	-	-	-
Monthly income (Rs/month)				
<10000	4	12	6	22(36.66)
10000-20000	13	3	5	21(35.00)
>20000	3	5	9	17(28.33)
Mean income	15350	14275	21400	17008.33
House				
Owned	20	19	20	59(98.33)
Rented	0	1	0	1(1.66)
Type of house				
Kuccha	0	11	0	11(18.33)
Semi-Pucca	15	6	6	27(45.00)
Pucca	5	3	14	22(36.66)
Source of drinking water				
Tap water	13	10	17	40(66.66)

Hand pump	7	10	1	18(30.00)
Bouri/ well	0	0	2	2(3.33)

Figures in parentheses represents percentage

Table 2: Land holding, agriculture and horticulture crops grow pattern by selected families

Particulars		Blocks			
		Panchrukhi (n=20)	Baijnath (n=20)	Bhawarna (n=20)	Total (N=60)
Size of land holding					
Marginal		1	4	2	7(11.66)
Small		9	8	8	25(41.66)
Medium		9	8	9	26(43.33)
Large		1	0	1	2(3.33)
Agriculture (Rabi crops)					
Wheat	Yes	19	19	18	56(93.33)
	No	1	1	2	4(6.66)
Oil seeds	Yes	15	15	16	46(76.66)
	No	5	5	4	14(23.33)
Potato	Yes	19	19	17	55(91.66)
	No	1	1	3	5(8.33)
Fodder crops	Yes	19	18	18	55(91.66)
	No	1	2	2	5(8.33)
Vegetables	Yes	19	20	18	57(95.00)
	No	1	0	2	3(5.00)
Agriculture (Kharif crops)					
Paddy	Yes	19	19	12	50(83.33)
	No	1	1	8	10(16.66)
Maize	Yes	19	20	16	55(91.66)
	No	1	0	4	5(8.33)
Soybeans	Yes	19	18	8	45(75.00)
	No	1	2	12	15(25.00)
Fodder crops	Yes	19	18	18	55(91.66)
	No	1	2	2	5(8.33)

Vegetables	Yes	19	20	16	55(91.66)
	No	1	0	4	5(8.33)
Horticulture					
Mango	Yes	11	5	2	18(30.00)
	No	9	15	18	42(70.00)
Pear	Yes	8	1	0	9(15.00)
	No	12	19	20	51(85.00)
Plum	Yes	7	3	2	12(20.00)
	No	13	17	18	48(80.00)
Sand pear	Yes	5	1	0	6(10.00)
	No	15	19	20	54(90.00)
Pomegranate	Yes	6	0	1	7(11.66)
	No	14	20	19	53(88.33)
Citrus	Yes	8	7	9	24(40.00)
	No	12	13	11	36(60.00)
Amla	Yes	7	1	0	8(13.33)
	No	13	19	20	52(86.66)
Guava	Yes	11	2	4	17(28.33)
	No	9	18	16	43(71.66)
Banana	Yes	7	2	2	11(18.33)
	No	13	18	18	49(81.66)
Use of produce from land					
In-sufficient		3	6	5	14(23.33)
Self-sufficient		13	13	15	41(68.33)
Marketed		4	1	0	5(8.33)

Figures in parentheses represents percentage

Table 3: Milch animals rearing pattern by selected farm women

Particulars	Blocks			
	Panchrukhi (n=20)	Bajnath (n=20)	Bhawarna (n=20)	Total (N=60)
Milch animals	20	20	20	60(100.00)
Animals				

Cow	20	20	20	60(100.00)
Buffalo	-	-	-	-
Goat	4	2	0	6(10.00)
Breed				
Desi	3	6	8	17(28.33)
Hybrid	17	14	12	43(71.66)
Yield (Kg)				
<5	2	7	6	15(25.00)
5-10	14	11	10	35(58.33)
>10	4	2	4	10(16.66)
Amount for consumption (Kg)				
<2	1	1	4	6(10.00)
2-4	19	17	13	49(81.66)
>4	0	2	3	5(8.33)
Amount for sale (Kg)				
<2	2	10	15	27(45.00)
2-4	6	8	3	17(28.33)
>4	12	2	2	16(26.66)
Other domestic animals				
Yes	12	6	3	21(35.00)
No	8	14	17	39(65.00)
Animals				
Pig	-	-	-	-
Poultry	12	5	3	20(33.33)
Sheep	0	1	0	1(1.66)
Breed				
Desi	8	4	3	15(25.00)
Hybrid	4	2	0	6(10.00)
Purpose				
Domestication	12	6	3	21(35.00)
Selling	-	-	-	-

Figures in parentheses represents percentage

Table 4: Food/dietary pattern of selected farm women

Particulars	Blocks			
	Panchrukhi (n=20)	Baijnath (n=20)	Bhawarna (n=20)	Total (N=60)
Food habits				
Vegetarian	13	15	14	42(70.00)
Non-vegetarian	6	5	6	17(28.33)
Ovatarian	1	0	0	1(1.66)
Frequency of non-vegetarian				
Once a week	-	-	-	-
Once in fortnight	-	-	-	-
Once a month	3	5	3	11(18.33)
Occasionally	4	0	3	7(11.66)
Never	13	15	14	42(70.00)
Meal time				
Breakfast	20	20	20	60(100.00)
Mid morning	0	0	1	1(1.66)
Lunch	20	20	20	60(100.00)
Evening tea	18	20	20	58(96.66)
Dinner	20	20	20	60(100.00)
After dinner	14	14	16	44(73.33)

Figures in parentheses represents percentage

Table 5: Anthropometric and skin fold thickness of selected farm women

Particulars	Blocks			
	Panchrukhi (n=20)	Baijnath (n=20)	Bhawarna (n=20)	Total (N=60)
Anthropometric				
Height (cm)	167.48±11.46	171.06±8.87	174.80±5.98	171.11±8.51
Weight (kg)	52.69±5.81	56.60±11.95	51.25±8.66	53.51±2.66
BMI (kg/m ²)	18.98±4.21	19.55±4.62	16.83±2.80	18.45±3.71
Blood pressure (mmHg)	119.20/73.35 ±13.65/8.68	130.00/80.70 ±20.78/10.94	133.90/78.15 ±20.91/14.96	127.70/77.40 ±6.21/3.04
Skin fold thickness (mm)				

Biceps	10.20±1.43	11.05±2.47	10.73±3.31	10.66±0.43
Triceps	12.45±3.00	15.48±3.49	12.76±2.48	13.56±1.67
Subscapular	11.42±3.18	12.85±2.80	15.15±2.03	13.14±1.88
Suprailiac	15.06±3.85	17.91±4.10	18.65±2.27	17.21±1.90

Values: Mean±SD

Table 6: Distribution of selected farm women on bases of body type, body composition and severity of malnutrition

Particulars	Blocks			
	Panchrukhi (n=20)	Bajjnath (n=20)	Bhawarna (n=20)	Total (N=60)
Body type				
Ectomorph (<20)	14	11	18	43(71.66)
Mesomorph (20-25)	4	7	2	13(21.66)
Endomorph (>25)	2	2	0	4(6.66)
Body composition				
Body density	1.04±0.00	1.04±0.01	1.03±0.00	1.04±0.00
Per cent fat	26.25±3.50	28.06±6.21	28.66±2.09	27.66±1.05
Fat weight(kg)	13.88±2.69	16.36±3.72	14.76±2.92	15.00±1.23
Lean body mass (kg)	38.81±4.16	40.99±4.75	36.49±5.92	38.77±2.34
BMI(kg/m²)				
Underweight (<18.5)	14	9	15	38(63.33)
Severe thinness (<14.00)	3	3	5	11(18.33)
Moderate thinness (14.00-16.99)	6	2	4	12(20.00)
Mild thinness (17.00-18.49)	5	4	6	15(25.00)
Normal (18.50-24.99)	4	9	5	18(30.00)
Over weight (25.00- 29.99)	1	2	0	3(5.00)
Obese (≥30.00)	1	0	0	1(1.66)
Obese I (30.00-34.99)	1	-	-	-
Obese II (35.00- 39.99)	-	-	-	-
Obese III (≥40.00)	-	-	-	-

Figures in parentheses represents percentage

Table 7: Distribution of selected farm women on basis of physical fitness rating and aerobic capacity

Particulars	Blocks			
	Panchrukhi (n=20)	Baijnath (n=20)	Bhawarna (n=20)	Total (N=60)
Physical fitness rating				
Excellent (>150)	1	0	0	1(1.66)
Very good (136-150)	1	1	2	4(6.66)
Good (116-135)	3	4	3	10(16.66)
High average (101-115)	4	7	6	17(28.33)
Low average (81-100)	5	4	4	13(21.66)
Poor (<80)	6	4	5	15(25.00)
Aerobic capacity (VO₂ml/kg 15 min.)				
Poor (<15)	6	4	5	15(25.00)
Low average (15-22.5)	4	5	4	13(21.66)
High average (22.6-30.0)	5	6	7	18(30.00)
Good (30.1-37.5)	5	5	4	14(23.33)
Very good (37.6-45.0)	-	-	-	-
Excellent (>45.0)	-	-	-	-

Figures in parentheses represents percentage

Table 8: Assessment of nutritional deficiencies among selected farm women

Particulars	Blocks			
	Panchrukhi (n=20)	Baijnath (n=20)	Bhawarna (n=20)	Total (N=60)
Protein Calorie Malnutrition				
Diminished subcutaneous fat	-	-	1(1.66)	1(1.66)
Muscle wasting	3(5.00)	2(3.33)	3(5.00)	8(13.33)
Oedema in ankles	1(1.66)	2(3.33)	3(5.00)	6(10.00)
Vitamin A deficiency				
Night blindness	-	-	-	-
Conjunctival xerosis	-	1(1.66)	2(3.33)	3(5.00)
Bitot spot	7(11.66)	8(13.33)	8(13.33)	23(38.33)
Vitamin D deficiency				
Knock knees or bow legs	7(11.66)	5(8.33)	8(13.33)	20(33.33)
Thiamine deficiency				
Oedema	1(1.66)	1(1.66)	1(1.66)	3(5.00)
Loss of ankle & knee jerks	5(8.33)	1(1.66)	4(6.66)	10(16.66)

Calf-muscle tenderness	9(15.00)	10(16.6)	9(15.00)	28(46.66)
Riboflavin deficiency				
Angular stomatitis	1(1.66)	1(1.66)	1(1.66)	3(5.00)
Angular scars	9(15.00)	1(1.66)	1(1.66)	11(18.33)
Cheilosis	1(1.66)	2(3.33)	4(6.66)	7(11.66)
Magenta tongue	5(8.33)	3(5.00)	3(5.00)	11(18.33)
Niacin deficiency				
Scarlet & raw tongue	1(1.66)	2(3.33)	4(6.66)	7(11.66)
Atropic lingual papillae	2(3.33)	5(8.33)	1(1.66)	8(13.33)
Tongue fissuring	4(6.66)	3(5.00)	3(5.00)	10(16.66)
Vitamin C deficiency				
Spongy & bleeding gums	1(1.66)	1(1.66)	4(6.66)	6(10.00)
Tender bone	1(1.66)	1(1.66)	3(5.00)	5(8.33)
Easy fatigue and listlessness	6(10.00)	3(5.00)	4(6.66)	13(21.66)
Iron deficiency				
Breathlessness on slight exertion	1(1.66)	4(6.66)	11(18.33)	16(26.66)
Pale conjunctiva	-	6(10.00)	2(3.33)	8(13.33)
Paleness of skin	1(1.66)	4(6.66)	1(1.66)	6(10.00)
Spoon shaped nails	1(1.66)	-	3(5.00)	4(6.66)
Feeling of lethargy/ Fatigue	10(16.66)	3(5.00)	14(23.33)	27(45.00)
Weakness/ Dizziness	11(18.33)	5(8.33)	15(25.00)	31(51.66)
Lack of concentration	5(8.33)	4(6.66)	12(20.00)	21(35.00)
Decrease physical activity	2(3.33)	11(18.33)	7(11.66)	20(33.33)
Poor physical development	12(20.00)	6(10.00)	6(10.00)	24(40.00)
Cold hand and feet	10(16.66)	3(5.00)	5(8.33)	18(30.00)
Iodine deficiency				
Thyroid enlargement	-	-	-	-
Feeling of lethargy	-	-	-	-
Poor development	-	-	-	-

Figures in parentheses represents percentage

Table 9: Mean daily food intake and percent food adequacy of selected farm women

Food groups (g per day)	SDI (g/day)	Blocks			
		Panchrukhi (n=20)	Bajnath (n=20)	Bhawarna (n=20)	Total (N=60)
Cereals & millets	330	243.18±25.09 (73.69)	252.51±18.80 (76.51)	235.65±24.23 (71.40)	243.78±6.90 (73.87)
Pulses	75	50.46±11.95 (67.28)	53.50±9.60 (71.33)	51.30±9.23 (68.40)	51.75±1.28 (69.00)
Milk (ml) & milk products	300	213.23±59.63 (71.08)	202.08±53.67 (67.36)	219.20±56.22 (73.06)	211.50±7.10 (70.50)
Roots & tubers	200	134.41±18.45 (67.21)	129.80±43.26 (64.90)	146.59±39.20 (73.29)	136.93±7.08 (68.46)

Green leafy vegetables	100	40.59±16.55 (40.59)	41.83±11.61 (41.83)	42.07±12.37 (42.07)	41.50±0.65 (41.49)
Other vegetables	200	137.45±13.27 (68.78)	124.53±36.17 (62.26)	124.69±23.37 (62.34)	128.89±6.05 (64.44)
Fruits	100	17.77±4.70 (17.77)	18.91±13.21 (18.91)	19.77±7.95 (19.77)	18.82±0.82 (18.81)
Sugar	30	34.81±2.33 (116.03)	33.78±3.63 (112.6)	32.37±7.43 (107.90)	33.65±1.00 (112.17)
Oils	25	32.14±3.84 (128.56)	30.96±4.68 (123.84)	31.74±4.60 (126.96)	31.61±0.49 (126.45)

Values: Mean±SD (Percent adequacy), SDI- Suggested Dietary Intake

Table 10: Mean daily nutrient intake and percent adequacy of nutrients of selected farm women

Nutrients	RDA	Blocks			
		Panchrukhi (n=20)	Baijnath (n=20)	Bhawarna (n=20)	Total (N=60)
Energy (kcal/day)	2730	2080.55±210.48 (76.21)	2115.41±239.21 (77.49)	2160.31±236.79 (79.13)	2118.76±32.65 (77.61)
Protein (g/ day)	60	43.27±5.11 (72.12)	46.88±4.00 (78.13)	42.54±4.25 (70.90)	44.23±1.90 (73.72)
Fat (g/ day)	30	34.03±2.35 (113.43)	30.38±5.18 (101.27)	33.77±3.02 (112.57)	32.73±1.66 (109.09)
Calcium (mg/ day)	600	421.47±71.29 (60.91)	477.73±62.42 (69.62)	417.36±56.93 (59.56)	432.19±20.71 (62.03)
Iron (mg/ day)	17	10.99±1.85 (64.65)	12.35±1.35 (72.65)	11.57±1.73 (68.06)	11.64±0.56 (68.45)
Carotene (µg/ day)	4800	282.30±52.02 (5.88)	176.82±75.47 (3.68)	208.34±76.66 (4.34)	222.49±44.21 (4.64)
Vitamin B ₁ (mg/ day)	1.4	0.60±0.14 (42.86)	0.79±0.23 (56.43)	0.61±0.19 (43.57)	0.67±0.09 (47.62)
Vitamin B ₂ (mg/ day)	1.6	1.04±0.11 (65.00)	1.06±0.21 (66.25)	1.10±0.25 (68.75)	1.07±0.02 (66.67)
Niacin (mg/ day)	18	10.61±1.77 (58.94)	11.11±1.35 (61.72)	9.02±1.29 (50.11)	10.25±0.89 (56.93)
Ascorbic (mg/ day)	40	22.87±4.91 (57.18)	25.38±13.79 (63.45)	20.48±9.55 (51.20)	22.91±2.00 (57.28)
Folate (µg/ day)	200	107.65±25.81 (53.83)	69.81±28.60 (34.91)	79.19±33.04 (36.90)	85.55±16.09 (42.78)
Mg (mg/ day)	340	125.96±22.85 (37.05)	139.50±25.69 (41.03)	138.02±25.62 (40.59)	134.49±6.06 (39.56)

Values: Mean±SD (Percent adequacy), RDA- Recommended Dietary Intake

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