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# IMPACT OF NUTRITION GARDEN AND IEC TRAININGS ON NUTRITIONAL STATUS OF FARM FAMILIES

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## ABSTRACT

Information Education & Communication (IEC) trainings on nutrition garden were conducted to create awareness and willingness among rural women to establish nutrition garden in order to increase availability of fresh fruits and vegetables for their families and to obtain cost effective means of solving micronutrient deficiency. Fifteen families were convinced to establish nutrition gardens in their backyard to enhance their nutritional status and after one year its impact was seen on the diet and nutrient intake of families. Majority of the families (46.66%) were belonging to lower socioeconomic status. All the families had negligible vegetable and fruit cultivation. The hemoglobin level of adult women and adolescent girls was found low because of lesser intake of green leafy vegetables and fruits resulting into lower intake of iron and vitamin C. After establishment of nutrition garden, average intake of micronutrients *viz.* calcium and iron was found to be increased.

**Key words :** Nutrition garden, IEC trainings, Hemoglobin, Micronutrient, Calcium, Iron

Since time immemorial women have been playing a key role in society by conserving the basic life support system e.g. land, water, food etc. Rural women play a crucial role in agricultural development and allied fields including crop production, livestock production, horticulture, post harvest operations, storage and preservation of foods and food management for family etc. The role of mother is very important in making children consume the right amount of food of good quality at the right time. But in India, rural diets are mostly not diversified as they depend on their own produced crops for family food and further rural women are not aware of the importance of fruits and vegetables in their daily diet. As a consequence, their diets show a very small share of fruits and vegetables resulting in multi-micronutrient deficiency. So IEC programmes on nutrition garden and various other aspects of foods and nutrition were conducted with an objective of creating awareness and willingness among rural women to establish nutrition garden in order to increase availability of fresh fruits and vegetables for their families and to obtain cost effective means of solving micronutrient deficiency.

## METHODOLOGY

A sample of 15 households was selected from the adopted village Jainagar of Uttarakhand state. Information on nutritional status indicators like anthropometry, dietary and nutrient intakes, hemoglobin level of vulnerable group was collected from selected families in order to analyze the situation before intervention. Information regarding general profile of the families was taken in terms of family size, type of housing, land holding, income, crops grown and social participation. Anthropometric measurements were recorded using standard procedures (Jelliffe, 1969). Food intake was studied by 24 hour recall method (Gibson, 1990) and nutrient intake was calculated and data was expressed per adult consumption unit (Gopalan et al, 1990).

IEC programmes (lectures and demonstration) were organized on importance of nutrition garden, their management, use of green leafy vegetables, diet during pregnancy and diet during lactation in the adopted village. A training of two days was also conducted on control and prevention of anaemia among the rural community in which rural men, women and adolescent girls participated. In the training, lectures on causes, food sources of iron and ways to control anaemia were organized. Besides this a video cassette on anaemia available in the department was also played for the rural women. Then the selected families were convinced and encouraged to establish nutrition garden in their backyard or unutilized area of household to enhance their micronutrient status. Demonstration and instruction on preparation of bed, layout, planning, seed sowing and crop rotation to give them basic idea about gardening and enhancing the yield were given prior to setting up of nutrition garden. After

one year of establishment of nutrition garden, a post survey was done to analyze the impact of setting nutrition garden and IEC trainings on dietary and nutrient intake of selected families.

## RESULTS AND DISCUSSION

### *General profile :*

Majority of families (66.66%) were nuclear with family size more than 5 members in 86.66 per cent of families. They possessed either *Kachha* house (53.33%) or *pucca* house (46.66%). Only 13.32 per cent families had land holding more than 10 acres. Majority of the families (66.65%) had land holding less than 5 acres. Inspite of small land holding, the main occupation of head of all the families was farming. Besides farming, 39.99 per cent and 33.33 per cent of families were also engaged in small business and service, respectively. Only one family (6.66%) had monthly income less than Rs 2400 and the rest had monthly income more than Rs 4800. Due to large family size per capita income of the families was low. Males were more educated than females as only 6.66 per cent of males were illiterate against 59.99 per cent illiterate females. The socio-economic status of the families revealed that majority of families (46.66%) were belonging to lower socio-economic status. The percentage of the families belonging to upper-lower, middle and upper-middle were 26.66, 13.33 and 6.66 per cent, respectively.

Table 1: Classification of women and adolescent girls according to different levels of anemia (% population)

| Family members | Level of anemia | | |
|---|---|---|---|
| | Deficient | Low | Acceptable |
| Adult women (N=27) | 14.8 | 70.4 | 14.8 |
| Pregnant women (N=1) | - | - | 100 |
| Lactating women (N=1) | 100 | - | - |
| Adolescent girls (N=13) | 15.4 | 38.5 | 46.1 |
| Note : Cut-off level of anemia as per WHO classification | | | |
| | Deficient | Low | Acceptable |
| Adult and lactating women | < 10 | 10.0-11.9 | ± 12 |
| Pregnant women | < 9.5 | 9.5-10.0 | ± 11 |
| Adolescent girls (13-18 yrs) | <10 | 10.0-11.9 | ± 12 |

The cropping pattern existing in the families revealed that the most extensively grown crops were wheat and paddy. Paddy was grown twice in a year. All the families had negligible vegetable and fruit cultivation. Social participation of the beneficiaries was found to be low as only 6.66 per cent of them were member of one organization and equal per cent (6.66%) were members of more than one organization.



### *Anthropometric measurements:*

In the present study, there were total 12 adolescent girls in the selected families and they were classified according to Gomez classification (Fig. 1). The results revealed that 66.67 per cent of them were normal and remaining had varying degrees of malnutrition. The women of the families were classified on the basis of BMI (Body Mass Index) and it was found that 64.0 per cent of the women were normal indicating adequate protein energy intake, whereas 36 per cent women fell in

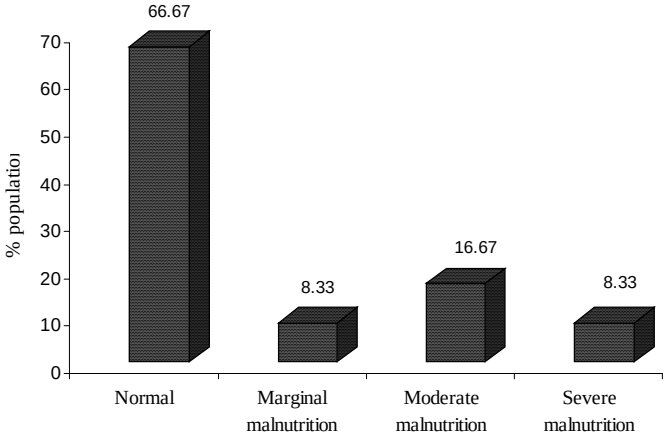


Fig 1: Classification of adolescent girls based on Gomez classification (N=12)

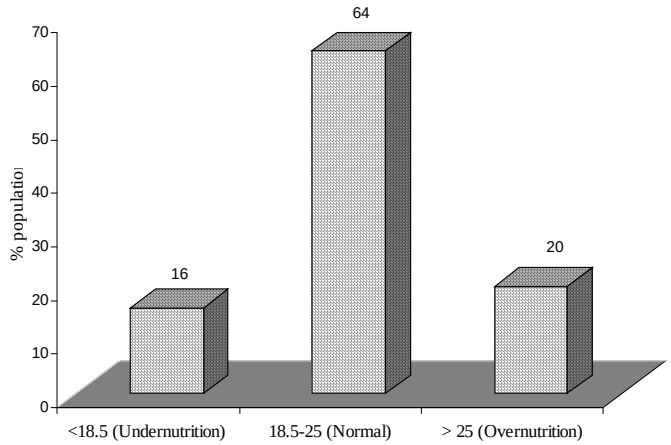


Fig 2: Classification of women by body Mass Index (N=25)

the category of malnutrition with 16.0 per cent women in under nutrition and 20.0 per cent over nutrition categories (Fig. 2).

***Hemoglobin level of women and adolescent girls :***

Hemoglobin level of the women and adolescent girls was estimated by Sahli's method. Hemoglobin level of adult women ranged between 8.5 to 10 g/dl whereas that of adolescent girls ranged between 9.0 to 14.0 g/dl. Table 1 reveals that only 14.8 per cent of adult women and 46.1 per cent of adolescent girls were having hemoglobin in the acceptable range. Rest of the subjects were either low or deficient in hemoglobin. This might be due to the fact that diet of the families included very small or negligible share of green leafy vegetables and fruits being expensive and less available resulting into lower intake of iron and vitamin C. So, by promoting nutrition garden in the space available in their backyard, the availability of green leafy vegetable and fruits was increased to the selected families and its effect was studied on their micro-nutrient status.

***Dietary and nutrient intake of families:***

Before intervention, the energy intake of families ranged between 1574 to 3099 k/cal with an average of 2278 ± 580 (Table 2). Calcium intake was in the range of 112 to 1968 mg with a mean value of 805.87 ± 497. Iron intake ranged between 8.6 to 31.0 mg with a mean value of 19.20 ± 7.7. Per cent adequacy of nutrient consumption of the families (Fig 3) revealed that only 79 per cent of energy requirement of the subjects was met which was mainly due to lower intake of carbohydrates (61.93 %). Protein and fat consumption was 112 ±34.5 and 207 ±78 per cent of the requirement, respectively. Miltch animals were possessed by 86.65 per cent of families resulting in higher intake of calcium as about 86.66 per cent of the families had calcium intake above 100 per cent of RDA (Table 3). Iron intake was only 68.6 ± 27.6 per cent of RDA and in 86.67 per cent of the families iron intake was below 100 per cent of RDA.

After establishment of nutrition garden and IEC trainings, increase in consumption of carbohydrate was seen due to availability of roots and tubers in daily diets from their cultivation in garden. Mean consumption of micronutrient such as calcium and iron were increased from 805.87 mg to 1023.27 mg and 19.20 mg to 23.37 mg, respectively. Iron intakes of all selected families increased after the intervention due to cultivation and increased consumption of green leafy vegetables. Adequacy of iron increased from 68.60 to 83.38 per cent. Some of the households also sold their garden's products to local shopkeepers which helped in improving their economic status. This also indirectly helped in increasing the intake of fruits and vegetables by the families and improving their micronutrient status.

Table 2: Mean nutrient intake of family (per adult consumption unit/day)

| Nutrient | Before intervention | After intervention |
|---|---|---|
| Protein(g) | 70.8 | 70.15 |
| Fat (g) | 41.3 | 39.27 |
| Carbohydrate (g) | 378.87 | 446.51 |
| Energy (k cal) | 2278 | 2460 |
| Calcium (mg) | 805.87 | 1023.27 |
| Iron (mg) | 19.20 | 23.37 |

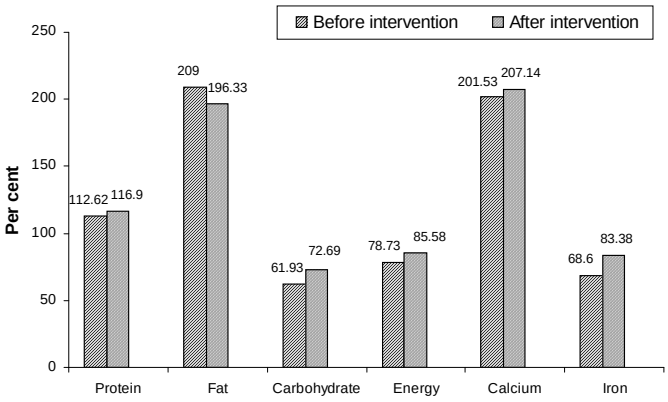


Fig 3: Per cent adequacy of nutrients (per ACU/day) compared to RDA

Table 3: Classification of subjects according to per cent adequacy of nutrients (per ACU/day) compared to RDA

| Per cent | Protein | | Fat | | CHO | | Energy | | Calcium | | Iron | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| of RDA | B | A | B | A | B | A | B | A | B | A | B | A |
| < 50 | - | - | - | - | 26.67 | 6.66 | - | - | 6.67 | - | 40.00 | 6.67 |
| 50-75 | 20.00 | 6.67 | - | - | 40.00 | 46.67 | 46.67 | 33.33 | - | - | 20.00 | 40.00 |
| 75-100 | 20.00 | 26.67 | 6.67 | - | 33.33 | 46.67 | 40.00 | 33.33 | 6.67 | 6.67 | 26.67 | 20.00 |
| >100 | 60.00 | 66.66 | 93.33 | 100.00 | - | - | 13.33 | 33.34 | 86.66 | 93.33 | 13.33 | 33.33 |

B- Before intervention, A- After intervention

## CONCLUSION

Establishment of nutrition garden and IEC trainings had immense role in ameliorating the problems of micronutrient deficiency as a significant increase was seen in the intake of micronutrients viz. calcium and iron due to cultivation and consumption of fruits and vegetables along with daily dietaries. Further, the sale of garden products will help the rural women to generate income and gain empowerment.

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