

## **Efficacy of Nutrition Counselling on the Nutritional and Haematological Profile of Elderly Males of Urban and Rural Areas**

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**ABSTRACT** A sample of 60 elderly males aged 60-75 yrs. i.e. 30 each from urban (Group I) and rural (Group II) areas belonging to low socio-economic status were selected from Ludhiana district. The average per capita monthly income was Rs. 898/- and Rs. 858/- in group I and II respectively. Nutrition counselling was carried out for three months through lectures, demonstrations, visual aids etc. by nine individual and three group contacts to the subjects along with their wives. Daily food intake of the subjects was recorded by using "24 hr. recall method" for three consecutive days before ( $T_1$ ) and after nutrition counselling ( $T_2$ ). The food intake in both the groups was inadequate in cereals, pulses, roots and tubers, other vegetables, fruits, milk and milk products. However, intake of GLV's, fats and oils, sugar and jaggery was higher than ICMR recommendations at  $T_1$  and  $T_2$  in both the groups. Average daily energy intake in group I and II was 2297 and 2276 and 2285 and 2269 Kcal at  $T_1$  and  $T_2$  respectively. All the subjects consumed diets inadequate in protein, vitamin A, niacin, riboflavin, vit. B<sub>12</sub>, iron and zinc, but adequate in energy, thiamine, calcium and phosphorus. The mean haemoglobin levels in group I and II at  $T_1$  and  $T_2$  were 12.94 and 14.49 and 13.15 and 14.78 g/dl. The study revealed that there was significant improvement in the nutrient intake and haematological profile of the subjects at  $T_2$  but it did not meet the recommendations. The poor status could be due to low income, illiteracy, ignorance, low availability of foods, loneliness, depression etc. There should be multi prolonged nutrition and health education programme, keeping in view the cost benefit analysis and severe financial constraints.

### **INTRODUCTION**

Nutrition is an important aspect of healthful behaviour and major components of general well being of individuals throughout their life cycle and is an important factor contributing to aging (Rondanelli et al., 2001). The NNMB (1991) reported that sizeable elderly population from eight states of India was suffering from chronic energy deficiency due to inadequacy of cereals, pulse intake and restricted vegetables and fruits which in turn lead to several vitamin and mineral deficiencies (Mehta, 1999).

Iron deficiency anaemia is a problem of serious public health significance as it impacts on psychological behaviour and work performance. In view of this, it is believed that it can be prevented by modifying the existing dietary pattern with locally available foods. Ignorance is one of the root causes which calls for education. This signifies that nutrition counselling is the sinequanon for bringing a permanent and favourable solution to the problem of malnutrition (Orstead, 1985). The prospective study was, therefore, undertaken to determine the effect of nutrient intake on haematological profile of elderly males as influenced by nutrition counselling and hence the present communication.

### **MATERIAL AND METHODS**

A sample of 60 elderly males aged 60-75 yrs. belonging to low socio-income group were selected from Ludhiana district and equally divided into two groups viz. urban (I) and rural (II) areas.

**Dietary Survey:** A complete record of the food intake of each subject was kept by "24 hr. recall method" for three consecutive days using standardized containers both at  $T_1$  (before) and  $T_2$  (after nutrition counselling). Nutritive value of diets was calculated by using MSU's Nutriguide Software Programme (Song *et al* 1992). Nutrient intake of the subjects was compared with RDA's suggested by ICMR (1990).

**Haematological Profile:** A series of haematological investigations of the subjects like Haemoglobin (Dacie and Lewis, 1975), Packed Cell Volume (Raghumarula et al., 1983), RBC Count (Hunder and Bornfod Method, 1968), Mean Corpuscular Volume (MCV), Mean Corpuscular haemoglobin (MCH) and Mean Corpuscular Haemoglobin Concentration (MCHC) were calculated during the study period at  $T_1$  and  $T_2$  and were compared with the suggested values.

**Nutrition Counselling:** It was imparted to the

subjects along with their wives by nine individual and three group contacts for a period of three months. Teaching was carried out through lectures and discussion, visual aids like charts, posters, participatory demonstration etc. The subjects were taught about balanced diet, functions of food, nutrient requirements, iron and vitamin rich food, importance of sprouting and fermentation etc.

**Statistical Analysis:** The results were statistically analysed in the computer. Student's 't' test was used to see the effect of nutrition counselling on the nutritional and haematological status.

## RESULTS AND DISCUSSION

The demographic information of the subjects in the present study revealed that average per capita income in group I and II was Rs. 898/- and Rs. 858/- p.m. Majority of the subjects in group I (60%) and II (70%) belonged to joint families. The data showed that 16.6 and 53.3 per cent of the subjects were illiterate. The literacy rate of Punjab was 69.95, which was 79.1 and 65.1 in urban and rural areas (Anon, 2001) which showed that urban elderly were more educated than their rural counterparts.

**Food Habits:** It was observed that 73.3 and 80% of the subjects in group I and II were vegetarian. It was seen that all the subjects in group I and II took breakfast and dinner, while lunch was taken by 76.6 and 20 per cent subjects at T<sub>1</sub> in both the groups respectively. Majority of the subjects in group I (83.3%) and group II (43.3%) started taking lunch at T<sub>2</sub> as they were educated not to have much gap in between the meals as it might create health problems. Lee-Chung et al. (1998) reported that meal skippers consumed fewer servings in all food groups and had lower dietary adequacy scores as compared to three meal eaters.

### I. Food Intake by the Subjects

The mean daily intake of cereals by group I and II was 255.42 & 272.07 and 282.54 & 289.54 g respectively at T<sub>1</sub> and T<sub>2</sub> which was less than the suggested intake of 350g (Table 1). The average daily intake of pulses by group I and II was 42.48 and 46.92 & 48.15 & 51.78 g respectively at T<sub>1</sub> and T<sub>2</sub> and was less than the RDA's (ICMR, 1990). It was also observed that diet was grossly inadequate in roots and tubers, other vegetables and fruit. A significant (P<0.01) increase in the intake was observed at T<sub>2</sub> in both the groups.

**Table 1: Average daily food intake of subjects (Mean±S.D.)**

Food group	Group I (n=30)		t-value	Group II (n=30)		t-value	Sugg- t-value ested <sup>1</sup> at T <sub>2</sub> intake level for group I balance v/s diet group II
	T <sub>1</sub>	T <sub>2</sub>		T <sub>1</sub>	T <sub>2</sub>		
Cereals	255.42±32.84	272.07±34.16	3.54***	282.54±50.05	289.54±48.56	2.13**	350 NS
Pulses	42.48±3.08	46.92±5.03	3.98***	48.15±9.49	51.78±5.55	2.37**	50 3.55***
Green leafy vegetables	70.4±16.99	60.23±13.34	3.44***	101.34±16.49	81.74±10.93	5.96***	50 6.83***
Roots and tubers	45.58±4.35	50.09±5.87	4.56***	57.40±4.88	60.42±5.07	2.87***	100 7.29***
Other vegetables	51.11±8.21	56.25±8.56	2.51**	44.64±4.85	47.92±5.62	1.99**	200 4.45***
Fruits	61.97±5.28	69.63±7.08	5.67***	33.00±5.95	40.09±6.90	3.57**	200 5.26**
Milk and milk products	197.43±32.12	212.73±13.02	4.09***	282.37±55.14	285.71±53.21	1.14 <sup>NS</sup>	300 2.41**
Sugar and jaggery	40.87±4.99	36.89±4.81	3.45***	48.03±4.22	39.28±3.84	2.38**	20 2.12**
Fats and oils	42.73±5.18	39.14±5.59	2.37**	512.01±5.16	40.10±6.16	8.09***	25 5.90***

\*\*Significant at 5% level

\*\*\*Significant at 1% level

<sup>1</sup>Pasricha and Thimmayamma (1997)

Bajaj et al. (1993) reported that the intake of vegetables in urban elderly was more as compared to rural elderly. It was observed in the present study that most of the times rural elderly took chapatias with chutney, jaggery, tea or butter milk but at T<sub>2</sub> the subjects started taking vegetables and fruits in their daily dietaries.

The average daily intake of milk and milk products in both the groups at T<sub>1</sub> and T<sub>2</sub> was less than the suggested intake of 300 ml (Pasricha and Thimmayamma, 1997). Majority of the subjects were of the opinion that it resulted in flatulence and hence this myth was cleared in their minds during nutrition counselling sessions. The foods which were the cause of concern in the present study were fats & oils and sugar & jaggery as their intake was more than the ICMR recommendations (1990). It was observed that fat intake in group I was mainly in the form of fried foods such as *pakorras*, *paranthatas*, *puras* etc. High intake of fat and oils in group II was due to the fact that they used to put extra ghee in *dal* and vegetables as they considered it to be a healthy food. The intake of sugar & jaggery was higher in rural elderly because they used to put more in milk and tea and also consumed jaggery

mixed in ghee alongwith chapatias. A reduction in fats & oils and sugar & jaggery was observed in both the groups at T<sub>2</sub>. Outram (2000) reported an improvement in the intakes of all the food groups after imparting nutrition counselling.

## II. Nutrient Intake by the Subjects

The data in Table 2 showed that the intake of energy was 2297 and 2276 and 2285 and 2269 Kcal at T<sub>1</sub> and T<sub>2</sub> in group I and II, respectively. A significant (P≤0.01) difference was observed at T<sub>2</sub> in both the groups. Intake of carbohydrates, protein, riboflavin, Vitamin B<sub>12</sub> was marginally adequate. The reduction in energy level in both the groups at T<sub>2</sub> was due to lower intake of fats and oils at T<sub>2</sub> as they were convinced to reduce their energy intake. The higher intake of protein in group II was due to increase in the consumption of sprouted pulses in the form of stuffed chapatias, salad, *chat*, *raita* etc. as they were taught the importance of sprouting during nutrition counselling sessions. Intake of niacin and zinc was inadequate in both the groups at T<sub>1</sub> and T<sub>2</sub>. Intake of Vitamin C was adequate only in group I at both T<sub>1</sub> and T<sub>2</sub> and it might be due to

**Table 2: Average daily nutrient intake of subjects (Mean±S.D.)**

Food group	Group I (n=30)		t-value	Group II (n=30)		t-value	RDA <sup>1</sup>	t-value group I v/s group II
	T <sub>1</sub>	T <sub>2</sub>		T <sub>1</sub>	T <sub>2</sub>			
Energy, Kcal	2297±27	2276±12.06	4.61***	2285±14	2269±14.48	5.07***	2264	14.29***
Carbo-hydrate, g	239.67±45.91	251.23±49.03	3.95***	267.97±36.71	270.77±37.55	0.71 <sup>NS</sup>	283	1.38 <sup>NS</sup>
Protein, g	56.18±9.34	59.78±9.57	2.78***	61.63±6.46	66.05±6.09	4.84***	64	6.09***
Vitamin A, µg	577.03±153.02	594.77±158.33	3.01***	560.60±165.86	586.20±165.42	2.44**	750	0.64 <sup>NS</sup>
Vitamin C, mg	44.57±7.82	50.69±8.03	3.99***	34.37±4.89	39.92±5.76	3.11***	40	4.86***
Thiamine, mg	1.37±0.30	1.39±0.29	NS	1.43±0.62	1.45±0.65	2.95***	1.1	0.62 <sup>NS</sup>
Riboflavin, mg	0.98±0.42	0.92±6.42	1.26 <sup>NS</sup>	1.13±0.47	1.01±0.45	1.09 <sup>NS</sup>	1.3	0.80 <sup>NS</sup>
Niacin, Mg	10.58±2.65	11.05±2.55	2.03**	11.00±3.25	11.15±3.40	2.11**	15	0.15 <sup>NS</sup>
Vitamin B12, µg	0.72±0.32	1.06±0.37	4.67***	0.70±0.44	0.71±32.51	1.66 <sup>NS</sup>	1.0	3.44***
Calcium, mg	0.96±0.22	1.12±0.25	2.06**	1.13±0.07	1.15±0.04	1.31 <sup>NS</sup>	1.0	1.23 <sup>NS</sup>
Phosphorus, mg	1.05±0.32	1.08±0.31	1.38 <sup>NS</sup>	1.11±0.31	1.13±0.32	1.97 <sup>NS</sup>	1.0	1.54 <sup>NS</sup>
Iron, mg	23.65±5.30	26.58±5.71	3.17***	29.19±4.27	32.23±4.54	4.06***	30	2.24**
Zinc, mg	6.17±1.47	6.92±1.24	2.21**	4.54±2.18	4.79±2.24	2.09**	15.5	4.55***

\*\* Significant at 5% level

\*\* Significant at 1% level

NS Not significant

1 Pasricha and Thimmayamma (1997)

more consumption of guavas, lemons amla etc. The intake of iron was 23.65 and 26.58 and 29.19 and 32.23 mg at T<sub>1</sub> and T<sub>2</sub> in group I and II respectively. A significant (p≤0.05) improvement in iron intake was observed at T<sub>2</sub> in both the groups as they regularly took green leafy vegetables. Moreover, they started replacing jaggery in place of sugar at T<sub>2</sub>. Juguan et al. (1999) reported that majority of elderly males had daily iron intakes below the RDA's.

### III. Haemopoetic Status (HB)

Table 3 depicted mean Hb levels of group I and II as 12.94±1.25 and 14.49±1.22 and 13.15±1.34 and 14.78±1.27 g/dl at T<sub>1</sub> and T<sub>2</sub> respectively and was within the suggested range. However, a significant (p≤0.05) improvement in Hb levels was observed at T<sub>2</sub> in both the groups. The mean PCV values in group I and II at T<sub>1</sub> and T<sub>2</sub> were 43.50±4.46 and 43.94±4.41 and 39.63±5.90 and 46.43±5.91 per cent respectively and were within the standards (Davidson and Passmore, 1987). The mean RBC count in group I at T<sub>1</sub> and T<sub>2</sub> was 4.47±0.42 and 4.56±0.42, while in group II, it was 5.71±3.19 and 5.94±5.35 10<sup>6</sup>/mm<sup>3</sup> at T<sub>1</sub> and T<sub>2</sub> respectively and were within the standards. Mean MCV at T<sub>1</sub> at T<sub>2</sub> in group I and II was 98.06 and 99.16 and 82.12 and 84.34 fl respectively. The mean values were within the range of 84-95 fl (Harper, 1965) in both the groups. Lower values of MCV were the indices of iron deficiency anaemia. The mean values of MCHC

and MCH were in the suggested range at T<sub>1</sub> and T<sub>2</sub>. The improvement in the haemopoetic status of the subjects at T<sub>2</sub> might be due to impact of nutrition counselling as they were taught to increase the intake GLV's and jaggery in their daily routine. Doyle et al. (1999) too reported that mean values of PCV, MCV, MCH and MCHC were in the range of standards for the elderly aged 75 yrs and above.

### Co-efficient Correlation (R) Between Different Determinants

The data revealed that there was a positive (p≤0.01) correlation (r) between Hb and protein intake, the value of 'r' being 0.380 and 0.351 in group I and II. A significant (p≤0.01) correlation was also observed between Hb and PCV. The values of 'r' being 0.591 and 0.520 in group I and II respectively. These correlation signified that greater part of iron in the body was present as Hb. Most of the body iron existed in complex form bound to protein as ferritin and transferrin. The perusal of the data clearly indicated that biochemical assessment status was indicative of the state of under nutrition with respect to iron, vitamin B<sub>12</sub>, vitamin A and protein.

### SUMMARY AND CONCLUSIONS

In the light of above discussion, the scrutiny of the data revealed that inadequate money, physical disability, loneliness, loss of appetite,

**Table 3: Haematological status of subjects (Mean±S.D.)**

Profile	Group I (n=30)		t-value	Group II (n=30)		t-value	Stan- dard	t-value at T <sub>2</sub> level group I v/s group II
	T <sub>1</sub>	T <sub>2</sub>		T <sub>1</sub>	T <sub>2</sub>			
Hb (g/dl)	12.94±1.25	14.49±1.22	5.11**	13.15±1.34	14.78±1.27	3.98***	12-16 <sup>S</sup>	2.21**
PCV (%)	43.50±4.46	43.94±4.41	1.08 <sup>NS</sup>	39.63±5.90	46.43±5.91	1.57 <sup>NS</sup>	36-47 <sup>S</sup>	2.61***
RBC count (10 <sup>6</sup> /mm <sup>3</sup> )	4.47±0.42	4.56±0.42	1.49 <sup>NS</sup>	5.71±3.19	5.94±5.35	2.19**	3.9-5.6 <sup>S</sup>	2.25**
MCV (fl)	98.06±12.94	99.16±12.6	2.11**	82.12±26.79	84.34±26.38	2.42**	84.95 <sup>#</sup>	3.15***
MCHC (g/dl)	32.23±2.2	33.09±2.89	1.79*	33.62±4.60	34.56±4.76	2.38**	33-38 <sup>#</sup>	1.44 <sup>NS</sup>
MCH (pg)	31.35±3.26	31.96±3.52	1.61 <sup>NS</sup>	27.12±7.86	29.36±7.98	2.22**	28-32 <sup>#</sup>	2.89***

\* Significant at 10% level

\*\* Significant at 5% level

\*\*\* Significant at 1% level

NS Not significant

# Harper (1965)

S Davidson and Passmore (1987)

dependence on others for their main economic resources were some of the social and health factors that influenced the nutritional status of elderly. The Central Government should formulate some policies of distributing iron and folic acid supplements free of cost to combat iron deficiency anaemia. There should be multi prolonged nutrition and health programme, keeping in view the cost benefit analysis and severe financial constraints.

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