



DIETARY INTAKE OF MACRO AND MICRO NUTRIENTS BY ELDERLY WOMEN RESIDING IN AN URBAN SLUM OF DELHI

KEYWORDS

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ABSTRACT *The present study was undertaken to assess the dietary intake of macro and micro nutrient intake among elderly women aged 60-70 years residing in slums of North West Delhi. A total of 49 elderly women were enrolled in the study. Dietary information was collected using 24 hour dietary recall method and food frequency questionnaire. Mean intake of nutrients was calculated using Dietsoft software and was compared with the Recommended Dietary Allowance of Indian Council of Medical Research. Dietary data was analysed using central 90% values. Nutrient intake of elderly women residing in urban slums indicated gross inadequacy in folate, vitamin B12, vitamin B6, vitamin A, riboflavin, carotenes and minerals like zinc, magnesium and iron.*

INTRODUCTION:

Nutrition plays an important role in health and quality of life of elderly. A balanced diet and adequate lifestyle are important factors for well being of elderly. Poor nutrition is often associated with a decline in functional status, impaired muscle function, decreased bone mass, immune dysfunction, anemia, reduced cognitive function, poor wound healing and mortality (Ahmed and Haboubi, 2010).

The proportion of elderly population is growing faster, as a result of longer life expectancy. According to United Nations report, about two thirds of the world's older persons live in developing countries (UN, 2013).

Limited studies are available in India indicating nutrition status and functional consequences among elderly population. Studies carried out among elderly in Ranchi and Allahabad revealed inadequate dietary intake of energy, protein, fat, iron, calcium, vitamin C and B carotene (Singh, 2016; Tirkey et al, 2015). The National Nutrition Monitoring Board carried out a survey in 8 states during 1996-1997 to assess the status of diet and nutritional status of elderly population and the time trends if any, in their diet and nutritional status over two decades since 1975-79. Findings suggested that median intake of nutrients except thiamin increased over a period of time among elderly (NNMB, 2000).

The present study was carried out to assess the dietary intake of macro and micro nutrients by elderly women residing in an urban slum of Delhi.

MATERIAL AND METHODS:

The study was carried out from January to March 2013 among elderly women aged 60 to 70 years, residing in Kirti Nagar slums of North West Delhi. Elderly study volunteers were identified and enrolled by community survey of slums with the help of local community leaders and paramedicals working in the area. Those suffering from chronic disease were not enrolled. Institutional ethical clearance was obtained. A written informed consent was taken from all the study volunteers. Forty nine elderly women were enrolled in the study. Dietary information was collected using 24 hour dietary recall for previous day (n=46) and food frequency questionnaire for the last two weeks (n=49). A set of standardized spoons, katoris and glass was shown to them to help them recall the approximate amount of food consumed. The raw weights of food item were calculated and entered in Dietsoft software. Mean intake of nutrients was calculated using 90% central values by Dietsoft software and was compared with the Recommended Dietary Allowance of Indian Council of Medical Research, 2010. Pretested questionnaires were used to collect information on dietary intake and socio demographic profile. Blood samples were analyzed for haemoglobin, vitamin B12, folate and homocysteine. However, in this paper we are presenting the data

with respect to dietary intake by elderly women.

RESULTS:

A total of 49 elderly women were enrolled for the study and information on dietary intake of macro and micronutrients was collected.

Nutrient intake

Data collected by 24 hour dietary recall for the previous day was analyzed for macro and micro nutrients using 90% central values. Mean, median, range and percent adequacy of RDA was calculated (Table 1).

Table 1: Nutrient intake among elderly women (n=46)

Nutrients	Mean	Median	S.D.	Range	Percentage Adequacy of RDA
Energy (Kcal/d)	1217	1243	274.64	730.13-1908.89	64.04
Protein (g/d)	39	39	10.99	20.38-66.76	70.25
Calcium (mg/d)	419	388	142.98	230.80-766.08	69.83
Iron (mg/d)	11.21	10.78	3.82	4.28-21.41	53.37
Zinc (mg/d)	5.31	5.26	1.77	2.34-10.20	53.09
Magnesium (mg/d)	5.25	4.91	4.15	1.93-27.67	1.70
Retinol (µg/d)	67.49	57.60	29.99	8.64-160.20	11.25
Carotene (µg/d)	457.62	221	732.61	23.60-2740.0	9.53
Thiamine (mg/d)	1.08	1.03	0.38	0.36-2.16	107.52
Riboflavin (mg/d)	0.53	0.49	0.18	0.25-1.02	47.83
Niacin (mg/d)	8.83	7.54	3.40	2.57-16.73	73.62
Vitamin B6 (mg/d)	0.10	0.09	0.08	0.16-0.22	4.82
Ascorbic Acid (mg/d)	28.84	24.53	18.43	2.40-72.45	72.10
Folic Acid (µg/d)	111.82	110.5	52.84	38.80-238.28	55.91
Vitamin B12 (µg/d)	0.18	0.17	0.11	0.03-0.60	17.63

Macronutrients: The mean intake of energy (1217±274.64 Kcal/day) and protein (39±10.99 g/day) was inadequate. The percent adequacy of energy and protein was 64.04% and 70% of the RDA respectively. The mean fat intake was 20±5.93 g/day.

Micronutrients: Thiamine intake was more than the RDA (107.52% of RDA) indicating high consumption of cereals. Calcium, niacin and ascorbic acid intake was around 70% of RDA (69.83-73.62%), while intake of iron, folate and zinc was 50% of RDA (53.09-55.91%) and that of riboflavin was 48% of RDA. Intake of vitamin B12, vitamin B6, magnesium, vitamin A was below 20% of their respective RDA (1.70-17.63%).

Food group intake: Cereal consumption was adequate (Table 2) while pulse consumption was 60% adequacy of RDA. Intake of leafy vegetable and vegetable was low which was less than 10% adequacy

of the RDA. Roots and tuber, fruits and milk intake by the respondents is less than 50% adequacy of the RDA.

Table 2: Food group intake by elderly (n=46)

Food Groups	ICMR RDA, 2011	Mean	Median	S.D.	Range	Percentage Adequacy of RDA
Cereals and millets	210	226.36	220.00	76.49	100-450	107.8
Pulses	60	36.07	30.0	20.59	0-90	60.1
Leafy vegetables	100	7.62	0.00	22.61	0-100	7.6
Other vegetables	200	15.36	0.00	27.17	0-100	7.7
Roots and tubers	200	69.88	70.00	36.65	0-160	34.9
Fruits	200	41.05	35.0	44.78	0-260	20.5
Milk	300	114.83	120.00	53.45	0-240	38.3
Fats and oils	20	11.86	12.00	4.72	4-22	59.3
Sugar / Jaggery	20	14.26	16.00	6.09	0-24	71.3

Food frequency questionnaire data collected from 49 elderly women indicated the following pattern of food intake:

Cereals: All the respondents consumed wheat flour daily. Rice was consumed daily by 76.2% of the respondents. Bread was consumed 2-3 times a week by 66.7% and rice flakes was consumed once a fortnight by 41.2% respondents. Rusk (64.3%) and fan (50%) were also consumed daily.

Pulses: Red gram dal was consumed daily (56.4%). Dal such as Bengal gram dal, black gram dal, lentils, green peas were consumed 2-3 times a week

Green leafy vegetable: Most of the green leafy vegetables such as spinach (58.5%), cabbage (46.1%), fenugreek leaves (40.5%) and coriander leaves (63.6%) were consumed 2-3 times a week.

Other vegetables: Vegetables like brinjal (33.3%) and cauliflower (68.3%) were consumed daily. Beans, pumpkin, bottle gourd, bitter gourd & cucumber were consumed once in a fortnight.

Milk & Milk products: Milk was consumed daily by 93.6% of the respondents (mostly in the form of tea). Paneer (60%) and curd (42.8%) were consumed once in a fortnight.

Roots and tubers: Onion (100%) and potato (97.9%) was consumed daily by the respondents. Carrot (48.9%) was consumed 2-3 times a week.

Fruits: Tomato was consumed daily by 70.7% of the respondents, followed by banana (40.9%) and papaya (26.7%) 2-3 times a week.

Sugar: Sugar was consumed daily by all the respondents

Fats and oils: Mustard oil was consumed daily by all the respondents. Refined oil was consumed daily by 30% of the respondents.

Meat & Poultry: Eggs (71.4%) & fish were consumed 2-3 times a week (33.3%). Chicken was consumed 2-3 times a week by 26.1% of the respondents.

DISCUSSION:

The present study was carried out to assess the dietary intake of

macro and micro nutrients by elderly women residing in an urban slum of Delhi. The study revealed that elderly women had inadequate nutrient intake except for thiamine. The food group data showed that intake of cereal was adequate. Agarwal (2016) also reported inadequate nutrient intake except for fat by retired elderly in Rajasthan. A study carried out among women (18-49 years) residing in slum clusters of West Delhi reported similar mean calorie (1242 Kcal/day) and protein intake (39 g/day) (Chhabra & Bhardwaj, 2013). The mean calorie intake was 1217 Kcal/day. Studies carried out in Maharashtra and Uttar Pradesh reported slightly higher mean intake of calorie by elderly women (Tirkey et al, 2015, Kimaya & Sharma, 2013). Yadav et al also revealed low energy and protein intake by elderly living in urban areas of Allahabad district (Yadav et al, 2012). As per National Sample Survey on Nutritional Intake in India (2011-2012), there is a decline in calorie intake and rising trend in per capita fat intake (NSS, 2014).

Micronutrient intake by elderly women was also found to be low except for thiamine. Arlappa et al (2005) also reported tribal elderly in India had nutrient intake lower than the recommended dietary intake. Our findings are similar to a community based cross-sectional study carried out in 260 households in an urban slum in North-East district of Delhi, where median micronutrient intake such as Vitamin A, riboflavin was found to be inadequate (Singh et al, 2015).

Nutrient intake of elderly women residing in urban slums indicated gross inadequacy in folate, vitamin B12, vitamin B6, vitamin A, riboflavin, carotenes and minerals like zinc, magnesium and iron. Energy, protein, calcium, niacin and ascorbic acid were moderately adequate.

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