Nutritional status of elderly people residing in Udaipur city

■ DIVYA PANDEY, VIBHA BHATNAGAR **and** VIMAL SHARMA

See end of the paper for
authors' affiliations

DIVYA PANDEY
Krishi Vigyan Kendra, WEST
KAMENG, DIRANG
(ARUNACHAL PRADESH) INDIA
Email: divyashukla8@
rediffmail.com and
divishukla@gmail.com

■ **ABSTRACT :** With improving life expectancy, there will be worldwide increase in the burden of chronic diseases and disabilities. Majority of health problems among the aged are diet related and nutritionally dependent, and hence appropriate and adequate nutrition is essential for health and well being of the elderly. The present study was undertaken to assess the nutritional status of 200 elderly males and females (60 -80 years) residing in Udaipur city. The parameters investigated include anthropometric measurements and dietary survey through 24-hour recall method. Mini Nutritional Assessment tool (MNA) was used to screen the elderly subjects and classify them as well nourished, at risk of malnutrition and malnourished. The mean daily food intake of elderly subjects showed that the intake of all the foodstuffs was lower than the balanced diet. However, in case of males the intake of milk and milk products was more than adequate. Mean height and weight of male subjects were 165 cm and 65.63 kg, whereas in females the mean height and weight were 157.5 cm and 64.65 kg. MNA classification indicated that 51 per cent of elderly males were well nourished as compared to only 29 per cent elderly females though females consumed on an average more calories and protein as percent of RDA as compared to males.

■ **KEY WORDS :** Elderly, Gender, Health, Diet, Nutrition

Aging refers to the normal progressive and irreversible biological changes occurring over an individual's life span. Although the process occurs in all people, it is often associated with significant changes in health and nutritional needs for those over 65 years of age. Old age is defined as the age of retirement, for it is at that time the combined effect of aging, social changes and diseases are likely to cause breakdown in health.

The world is at present passing through an epidemiological transition with the rate of growth of elderly population exceeding the general population. Improvements in health care, sanitation and quality of diet have led to an increase in average life span and a dramatic shift in population towards of older age groups. Now India has the second highest population of elderly in the world next to China.

Nutrition plays a significant role in modulating ageing. It influences age-related functional decline in a wide variety of organ systems. Nutrition is also linked with many chronic diseases that afflict the elderly. Hence, nutrition is found to be a key factor for successful aging.

The assessment of the nutritional status is an important component of geriatric evaluation. Newer, non-invasive methods have come up which make nutritional assessment of the elderly quicker and easier. Guigoz *et al.* (1996) had developed and validated a Mini Nutritional Assessment, a non-invasive tool used to determine the risk of malnutrition, which was applied in the present investigation to classify and to identify nutritionally at risk elderly men and women.

■ **RESEARCH METHODS**

Locale of the study :
Study was conducted within the municipal limits of Udaipur city in Rajasthan, India.

Selection of sample :
The city was divided into four zones *i.e.* North, South, East and West. Health camps were organized in all the zones of the city, with the help and assistance from the societies

for senior citizens, pensioners' society and other well-established clubs of the city. The study was conducted on 200 elderly (males-100 and females-100) aged 60-80 years attending these camps.

Selection and construction of tool :

Keeping in mind the objectives and sample of the study, interview technique was used. For this purpose an interview schedule was developed, which included the following sections:

I. Section :

This section covered background profile of the subjects. Information regarding the age, religion, educational level, food habit and life style factors *i.e.* alcohol consumption/ smoking habit, physical activities, were collected.

II. Section :

This section dealt with the assessment of nutritional status of the elderly subjects. For this purpose, the Mini Nutritional Assessment (MNA) tool was applied on all the subjects. MNA classification was used to categorize the subjects into three groups, *i.e.*, malnourished, at risk of malnutrition and well-nourished.

It consists of 18 questions under four headings namely:
–Anthropometric assessment including measurements of height, weight, BMI, arm and calf circumference and recent weight loss.
–General assessment involving six questions related to life style, medication and mobility.
–Dietary assessment involving eight questions related to number of meals, food and fluid intake and autonomy feeding.
–Subjective assessment questions are indicative of self perception of health and nutrition.

The answer to each question was given assigned score and total score was calculated for each individual. The total score range from 0-30 and scores of <17.5 indicates malnutrition, 17.5-23.5 risk of malnutrition and >24 well nourished (Guigoz *et al.*, 1996).

III. Section :

This section dealt with the detailed information on dietary intake by 24-hour recall method. Information thus obtained was converted in terms of nutrients with the help of food composition tables (Gopalan *et al.*, 2004) and compared with RDA for elderly (Pasricha and Thimmayamma, 1997) to find out adequacy of nutrient intake.

■ **RESEARCH FINDINGS AND DISCUSSION**

The background profile of 200 elderly (males-100,

females-100) indicated that majority of the study population was Hindu (> 90%).The educational level was higher in male as compared to female under all classification and that illiteracy / low-level education was observed in women population. The study population was predominantly vegetarian (approx. 90%). The incidence of smoking and occasional drinking was observed in some males (Table 1).

Table 1: Back ground information of the elderly people (n=200)		
Information	Males (n=100)	Females (n=100)
Religion		
Hindu	92	94
Muslim	4	5
Sikh	4	1
Education		
Post doctoral	15	1
Post graduates	16	12
Graduate	26	19
Sr. Secondary	27	21
Secondary	9	22
Primary	5	12
Illiterate	2	13
Food habits		
Vegetarian	88	95
Non-vegetarian	12	5
Other habits		
Smoking consumption	13	-
Alcohol consumption	9 (frequently)	-

All values are numbers in each group

The average height of elderly female was significantly (p<0.01) lower than elderly male while there was no significant difference in weight of elderly males and females. The body mass index, mid arm circumference of elderly female were significantly (p<0.01) higher as compared to males. The calf circumferences of both elderly male and female were identical (Table 2).

Table 2 : Anthropometric measurements of elderly males and females		
Parameters	Males (n=100)	Females (n=100)
Height (cm)	165.05±6.59 (0.65)	158.57± 6.16 (0.61)**
Weight (kg)	65.63±10.34 (1.03)	64.65±9.36(0.94)N.S.
BMI	24.14±3.90(0.39)	25.98±3.95(0.39)**
Mid arm circumference (cm)	26.73±2.99(0.29)	28.71±3.77(0.37)**
Calf circumference (cm)	32.74±3.19(0.31)	33.43±3.79(0.39) N.S.

All values are Mean ± SD (SE), p<0.01 as compared with males,
N.S. = Non-significant

Scoring based on the MNA revealed that 6 per cent of elderly males were malnourished, 43 per cent were at risk of malnutrition while 51 per cent were well nourished whereas 14 per cent of the elderly females were malnourished, and 57 per cent at risk of malnutrition and 29

per cent were well nourished. Significant difference existed between the percentage scores of both (elderly male and female). In elderly women malnutrition was at greater predisposition (Table 3).

Table 3: Nutritional status by MNA classification

Nutritional status (MNA score)	Male (n=100)	Female (n=100)
Malnourished (> 23.5)	6	14
At risk of malnutrition (17.5- 23.5)	43	57
Well nourished (< 17.5)	51	29

The MNA status in elderly females compared well with those reported by Jose and Kumari (2001) for elderly females from Cochin wherein malnourished, at risk of malnutrition and well-nourished were 20, 53 and 27 per cent, respectively. However the situation in case of elderly males was different and that the percentage of elderly males in malnourished, at risk of malnutrition and well nourished groups were 24, 44 and 31 per cent, respectively, thereby indicating that the incidence of malnutrition was more in their study group.

The cereal intake by elderly male was 44 per cent of the BD while in case of elderly female it was 73 per cent of the BD. Similarly the intake of pulses in elderly male was 70 per cent of BD while female consumed 96 per cent of the BD, which is quite adequate. Elderly males had a much higher consumption of milk and milk products (137% of BD) while elderly female consumed milk and milk product equal to 87 per cent of the BD. The consumption of roots and tubers by both elderly males and females can be considered as near BD. It was observed that both elderly males and females consumed nearly 20 per cent more green leafy vegetables over BD. The consumption of other vegetables was 50 per cent BD in case of elderly males and 65 per cent BD in case of elderly females. The fruit consumption was approximately 75 per cent of BD in case of elderly males and females. Similar study by Brahman (1994) revealed that cereal consumption, milk and milk products consumption was more in aged women and men. Roots and tubers consumption were adequate (100g/day) in both groups, sugar was consumed in an adequate quantity and fast consumption was low in aged men and women (Table 4).

Based on calculation, the calorie intake in elderly male was 57 per cent of RDA, while females consumed 80 per cent of RDA. In case of protein, males consumed 59 per cent of RDA while elderly females consumed 76 per cent of RDA. The fat consumption in elderly male was 88 per cent of RDA while in elderly females it was 105 per cent of RDA. The intake of calcium, iron, carotene, thiamine and riboflavin in elderly males and females were 65, 55, 32, 39, 205, 118, 96, 79, 61 and 58, respectively as per cent of RDA (Table 5).

Table 4: Mean value of food intake by the subjects

Sr.No.	Food stuffs	BD-males	Males	BD- females	Females
1.	Cereals	350	154.2 (44.0)	225	163.3 (72.6)
2.	Pulses	50	34.88 (69.8)	40	38.43 (96.1)
3.	Milk and milk products	300	411.57 (137.2)	300	260.1 (86.7)
4.	Roots and tubers	100	108.61 (108.7)	100	95.83 (95.9)
5.	Green leafy vegetables	50	60.05 (120.0)	50	63.6 (127.1)
6.	Other vegetables	200	102.11 (51.1)	150	97.0(64.7)
7.	Fruits	200	150.9(75.4)	200	130.9 (65.4)
8.	Sugar	20	22.1(110.0)	20	17.0 (85.0)

BD =Balance diet. All values are in g, parenthesis values are % of BD

Table 5: Mean nutrient intake by the elderly subjects

S.No.		Males		Females	
		RDA	Actual	RDA	Actual
1.	Calories (kcal)	2200	1250.4 (56.8)	1700	1347.6 (79.3)
2.	Protein (g)	65	38.2 (58.8)	50	37.9 (75.8)
3.	Fat (g)	50	43.9 (87.7)	40	42.1 (105.2)
4.	Calcium(mg)	1000	655.6 (65.6)	900	501.2 (55.7)
5.	Iron (mg)	38	12.2 (32.0)	30	11.7 (39.0)
6.	Carotene (mg)	1030	2113.6 (205.2)	930	1105 (118.8)
7.	Thiamin (mg)	1.96	1.09 (96.05)	1.45	1.15 (79.3)
8.	Riboflavin (mg)	1.78	1.09 (61.2)	1.51	0.90 (58.3)

RDA= Recommended Dietary Allowance, Values in parenthesis are % of RDA

Brahman (1994) reported the intake level of micronutrients such as iron, vitamin A, riboflavin and niacin was lower than the RDA for both elderly males and females although their energy and protein intake was satisfactory.

Srivastava *et al.* (1996) reported that the diets of elderly men were deficit of 50 per cent for energy, 41.6 per cent for protein, 51.4 per cent for calcium, 58.5 per cent for iron and 50 per cent for thiamine. Similarly, dietary intake of elderly women showed a deficit of 35.5 per cent for energy, 16 per cent for protein 51 per cent for calcium, 50 per cent for iron and 23 per cent for thiamin. Similar results were also observed by Bhooma and Chitra (2005).

Conclusion :

It can be concluded that in the predominantly Hindu population the elderly males were taller than their female counterparts however the BMI was more in females. The population of malnourished, at risk of malnutrition was more in elderly females though they consumed on an average more calories and protein as per cent of RDA as compare to males.

Authors' affiliations:
VIBHA BHATNAGAR AND VIMAL SHARMA, Department of Foods and Nutrition, College of Home Science, Maharana Pratap University of Agriculture and Technology, UDAIPUR (RAJASTHAN) INDIA

■ REFERENCES

Gopalan, C., Rama Sastri, Balsubhramanium (2004). *Nutritive value of Indian foods*, National Institute of Nutition, India Council of Medical Research, Hyderabad (A.P.) INDIA. 98.

Bhooma, N. and Chitra, P. (2005). Trace minerals and mgnesium profile of instituitonalized elderly. *Indian J. Nutr.&Dietet.,***42**:201-206.

Brahmam, G.N.V. (1994). Nutritional status of the aged. In : Ramchandran, S.R., Shah, B. (Eds.) *Public Health implications of aging in India*. ICMR, NEW DELHI, INDIA.

Gopalan, C., Ramashastri, B.V. and Balasubramanian, S.C. Revised and updated by Narasinga Rao, B.S., Deosthale, Y.G. and Pant, K.C. (2004). *Nutritive value of Indians foods*. National Institute of Nutrition, ICMR, Hyderabad (A.P.) INDIA.

Guigoz, Y., Vellas, B. and Garry, P.J. (1996). The Mini Nutritional Assessment as part of the geriatric evaluation. *Nutr.Rev.,***54**: S59-S67.

Jose, S. and Kumari, P.S. (2001). Nutritional status of elderly in government aided and private run old age homes of Cochin- A comparative study. *Indian J. Nutr. & Dietet.,* **38**: 109-113.

Pasricha, S. and Thimmayamma, B.V.S. (1997). Dietary tips for the elderly. National Institute of Nutrition. ICMR, Hyderabad (A.P.) INDIA.

Srivastava, M., Kapil, U., Kumar, V., Dey, A.B., Nagarkar, K.M. and Sekran, G. (1996). Knowledge, attitude and practices regarding nutrition in patients attending geriatric clinic at AIIMS. In: Kumar, V., (Ed.) Aging – Indian perspective and global scenario pp. 407-409.

8th
Year
★★★★★ of Excellence ★★★★★