

Evaluation of nutritional status of elderly people residing in old age home and in their residence of Kolhapur city

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■ **ABSTRACT** : Ageing is a complex phenomenon that is accompanied by physiological, psychological and social changes contributing to declining health status. Today's busy work structure and the nuclear family cluster gave way to the growth of many old age homes which are all flooded. Old age home has given a moral support to many needy elderly people, but the big question arises about their psychological, nutritional and health status. The present investigation was designed to evaluate the nutritional status of elderly people residing in old age home and residing in selected residential zone of Kolhapur city. Difference in their nutritional status was compared. A total of 100 elderly people were included in the study. A pre-designed and pre-tested questionnaire was used to collect the information of study population. Socio-economic status, dietary intake pattern, anthropometric measurements and clinical examinations were the parameters used to evaluate the nutritional status of the selected subjects. The present study had shown that there was a significant difference in food intake pattern, nutrient intake pattern, anthropometric measurements and clinical assessment of residential zone elderly and elderly residing in old age home. A nutrient intake of residential zone elderly was much better than elderly residing in old age home when compared with RDA.

■ **KEY WORDS** : Elderly, Dietary intake pattern, Anthropometric measurements, Clinical assessment

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The world is at presently passing through an epidemiological transition with the rate of growth of elderly population as 8.0 per cent in the exceeding of general population. It is well known that the numbers of elderly people are increasing. Life expectancy in the developed world is now 80 years for females, and 75 years for males. The old age has started emerging as the social problem in Indian society due to the socio-cultural changes brought about by Indus trial revolution. The past recognition of old man or woman in the family, neighborhood and community as mentor has been reduced to the greater extent in modern Indian life. Therefore, old man or woman perceive low social worth or self-esteem in certain family situations. In the recent times, a new trend is being observed among the middle class aged population of India. More and more senior citizens hailing from the Indian middle class background are seeking accommodation in the old age homes. Nutritionally

inadequate diets can contribute to or exacerbate chronic and acute diseases, hasten the development of degenerative diseases associated with aging, and delay recovery from illness. (Agnihotri,1976; Posner, 1979; Ananthraman,1982; Dutta, 1989; Rammurti, 1962 and Saha, 1984).

Many authorities believe that malnutrition among the elderly is most often due to loneliness and the old age is a time of losses. Today's busy work structure and the nuclear family cluster gave way to the growth of many old age homes which are all flooded. Senior citizens across the world are seen to suffer from negligence and health negligence problems. Aliments and diseases are becoming expensive and the elderly need a lot of support to be able to tide across these problems.

The present study was undertaken to evaluate the health and nutritional status of the old age people with the comparison between residential and old age home.

RESEARCH METHODS

Data collection:

The study was undertaken in Kolhapur city. The subjects were selected from Matoshree Old Age Home located in area of R.K. Nagar and a specified residential zone in Kolhapur city of Karveer tehsil in Kolhapur district of western Konkan zone of Maharashtra state. The area of the study was selected by using the purposive random design method.

Tools and techniques:

The-self structured questionnaire was devised to evaluate the nutritional status of elderly. Food frequency method and 24 hours dietary recall were taken to assess the dietary intake pattern of the elderly. Dietary assessment was carried out by asking questions regarding diet history such as degree of vegetarianism, number of meals consumed, dietary pattern, type of meal preferred, food likes and dislikes.

Anthropometric measurements such as height (cm), weight (kg), body mass index (kg/m²), arm circumference (cm), wrist circumference (cm) and mid arm muscle circumference (cm) were recorded which were indicators of nutritional status by using standard formulae given by Jelliffe (1966). Clinical assessment was carried out by interviewer only in a good light by direct observations and interview method. Clinical signs related to major nutrient deficiencies such as vitamin A, iron, iodine and calcium deficiencies were observed and recorded with the help of doctor.

Statistical analysis:

For the statistical analysis of data, SPSS (Statistical Package for social Sciences) was used. The measure of variability is standard deviation (S. D.), which was used for

calculation of high statistics such as variance, co-efficient of correlation, standard score, standard error etc. 't' test was carried out to find statistical difference.

RESEARCH FINDINGS AND DISCUSSION

Out of the total one hundred elderly populations studied, fifty subjects were inmates of old age home and fifty subjects were residing in their houses.

Socio-economic status:

Table 1 shows that maximum numbers of elderly males were in the age group of 60-70. Number of married elderly subjects from selected residential zone were higher than unmarried and widow elderly subjects. It was noticed that, 24 per cent males were illiterate from residential zone while none was reported illiterate among elderly males residing in old age home. It was also found that illiteracy rate of female elderly subjects from selected residential zone was more than elderly females residing in old age home. It was observed that maximum numbers of elderly subjects from both groups have taken their education below 12th standard. The data regarding type of occupation in past showed that maximum number of males from old age home had service while maximum number of males from selected residential zone had their own business. All female subjects were found non working in selected residential zone of Kolhapur city while few females from selected old age home had service.

Dietary intake pattern:

From Table 2 it is reported that maximum number of males from old age home were lacto-vegetarian where as maximum number of males from selected residential zone were non vegetarian. It was observed that, all male and female subjects from old age home were following three meal

Table 1: Distribution of study population according to age and gender

| Sr. No. | Age group (years) | Residential zone | | | | Old age home | | | |
|---------|-------------------|------------------|----------|---------------|----------|--------------|----------|---------------|----------|
| | | Male (n=25) | | Female (n=25) | | Male (n=25) | | Female (n=25) | |
| | | Frequency | Per cent | Frequency | Per cent | Frequency | Per cent | Frequency | Per cent |
| 1. | 60-70 | 15 | 60 | 9 | 36 | 18 | 72 | 14 | 56 |
| 2. | 71-80 | 8 | 32 | 16 | 64 | 5 | 20 | 7 | 28 |
| 3. | 81-90 | 2 | 8 | - | - | 2 | 8 | 4 | 16 |

Table 2 : Distribution of elderly subjects according to their dietary habits

| Sr.No. | Dietary habit | Residential zone (n=50) | | Old age home (n=50) | |
|--------|-----------------------|-------------------------|----------|---------------------|----------|
| | | Frequency | Per cent | Frequency | Per cent |
| 1. | Vegetarian | - | - | - | - |
| 2. | Lacto -vegetarian | 13 | 26 | 35 | 70 |
| 3. | Ova lacto -vegetarian | 1 | 2 | 5 | 10 |
| 4. | Non-vegetarian | 36 | 72 | 10 | 20 |

pattern where as in residential zone, some subjects had two times meal pattern and very few subjects had three and four time meal pattern (Fig.1).

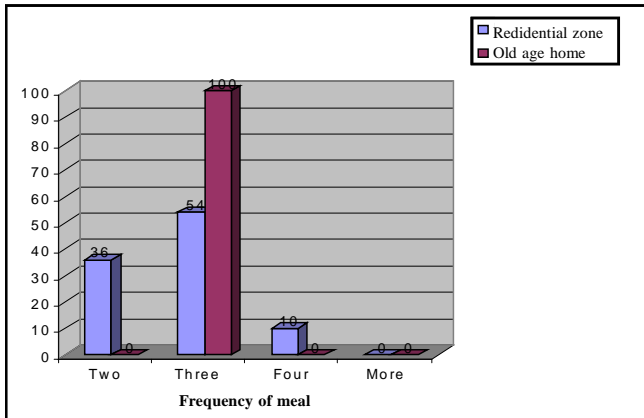


Fig. 1: Distribution of elderly people according to their frequency of meals

Food intake pattern:

A significant difference was found in all food group intakes of elderly males of residential zone and old age home. In female elderly subjects, non-significant difference was found in pulse and fats/oil intake only. Food group intake of all elderly subjects of residential was found higher compared to elderly subjects residing in old age home.

Nutrient intake pattern:

The data regarding nutrient intake of residential zone elderly and old age home elderly were calculated are and presented in Table 3 along with per cent of adequacy.

A highly significant difference was seen in all nutrient intake of elderly males except vitamin B₃, vitamin C and iron. The average values of nutrient intake of residential zone elderly males were seen much higher compared to old age home elderly males. In female elderly subjects, only protein, vitamin B₁, vitamin B₂, β-carotene and calcium intake had

Table 3 : Average nutrient intake by elderly

| Sr. No. | Nutrients | Male | | | Female | | |
|---------|------------------------------|------------------------------|--------------------------|----------|------------------------------|--------------------------|----------|
| | | Residential zone Mean ± S.D. | Old age home Mean ± S.D. | t' value | Residential zone Mean ± S.D. | Old age home Mean ± S.D. | t' value |
| 1. | Energy (kcal) | 1420.8 ± 251.2(61.2) | 1122.3 ± 160(48.3) | 5.01** | 1174.2 ± 280.3(61.8) | 1164 ± 170.5(61.2) | 0.15 NS |
| 2. | Protein(g) | 40.5 ± 7.2(67.5) | 30.9 ± 4.7(51.5) | 5.60** | 35.4 ± 6.2(64.3) | 30.9 ± 4.9(56.1) | 2.81** |
| 3. | Fat(g) | 45.1± 8.2(90.2) | 37.4± 6(74.8) | 3.76** | 36.3± 7(90.7) | 38.3 ± 5.3(76.6) | 1.12 NS |
| 4. | Vitamin B ₁ (mg) | 1.0 ± 0.3(83.3) | 0.85 ± 0.1(70.8) | 4.24** | 1 ± 0.4(100) | 0.8 ± 0.1(80) | 3.06** |
| 5. | Vitamin B ₂ (mg) | 0.7± 0.3(50) | 0.4 ± 0.08(28.5) | 4.84** | 0.5 ± 0.1(45.4) | 0.38 ± 0.06(34.5) | 5.00** |
| 6. | Vitamin B ₃ (mg) | 6 ± 3.4(37.5) | 6.5 ± 1.1(40.6) | 0.77 NS | 6.8 ± 1.9(56.6) | 6.7 ± 1.3(55.8) | 0.32 NS |
| 7. | Vitamin C (mg) | 58.1 ± 32.8(145.2) | 47.8 ± 15(119.5) | 1.42 NS | 48.7 ± 31(121.7) | 36.4 ± 19.6(91) | 1.67 NS |
| 8. | -carotene (µg) | 1046.3 ± 295.9(21.7) | 584.1 ± 276.8(12.1) | 5.70** | 969.6 ± 679.9(20.2) | 544 ± 201.6(11.3) | 3.00** |
| 9. | Iron (mg) | 9.7 ± 2.9(57) | 8.4 ± 2(49.4) | 1.84 NS | 8.5 ± 2.8(40.4) | 9.8 ± 3.9(46.6) | 1.33 NS |
| 10. | Calcium (mg) | 504 ± 191.4(84) | 367.1± 41.3(61.1) | 3.49** | 507.6 ± 155(84.6) | 369.6 ± 31.8(61.6) | 4.36** |
| 11. | Zinc (mg) | 3.4 ± 0.1(28.3) | 2.7± 0.7(22.5) | 3.07** | 3.7± 4.8(37) | 2.86 ± 0.7(28.6) | 0.91 NS |
| 12. | TDF(total dietary fibre) (g) | 23.8 ± 6(95.2) | 17.9 ± 3.5(71.6) | 4.22** | 20.4 ± 6.4(81.6) | 18.6 ± 3.7(74.4) | 1.27 NS |

Figures in parentheses indicate per cent of R.D.A., NS =Non-significant, * and ** indicate significance of values at P=0.05 and 0.01, respectively

Table 4 : Anthropometric measurements of elderly people

| Sr. No. | Anthropometric measurements | Male | | | Female | | |
|---------|-----------------------------|------------------------------|--------------------------|----------|------------------------------|--------------------------|----------|
| | | Residential zone Mean ± S.D. | Old age home Mean ± S.D. | t' value | Residential zone Mean ± S.D. | Old age home Mean ± S.D. | t' value |
| 1. | Weight (kg) | 62 ± 9.9 | 50.8 ± 9.6 | 4.07** | 56.6 ± 11.1 | 47± 11.2 | 3.03** |
| 2. | Height (cm) | 160.8 ± 6.6 | 155.4 ± 10.1 | 2.23* | 149 ± 4.38 | 148.3 ± 4.3 | 0.53 NS |
| 3. | B.M.I. (kg/m ²) | 23.8 ± 3.2 | 21.1 ± 2.1 | 3.70** | 25.4 ± 4.3 | 21.0 ± 4.39 | 3.55 ** |
| 4. | Arm circumference(cm) | 31.1 ± 3.6 | 27.8 ± 2.0 | 3.87** | 28.9 ± 3.1 | 26.6 ± 3.1 | 2.63* |
| 5. | Wrist circumference(cm) | 15.6 ± 0.99 | 15.3 ± 0.96 | 1.18 NS | 14.7 ± 0.68 | 14.1 ± 0.88 | 2.86** |
| 6. | MUAC (cm) | 27.9 ± 3.3 | 25.9 ± 2.3 | 2.46* | 26.8 ± 2.7 | 24 ± 3.4 | 3.17** |

NS= Non-significant, * and ** indicate significance of values at P=0.05 and 0.01, respectively

shown significant difference. The nutrient intake of the elderly subjects from both study places was compared with RDA for Indians given by the ICMR and was found much below than requirement. The intake of macro and micro nutrients was found to be much below than suggested recommended standards in both places of the study. The dietary intake was markedly deficient in protein. It was also deficient in energy, calcium, iron, vitamin C and B-complex vitamins and this was reflected in their clinical examination results. The fat intake of the elderly subjects from residential zone was very high compared to RDA and this was reflected in their high BMI values.

Nutritionally inadequate diets can contribute to or exacerbate chronic and acute diseases, hasten the development of degenerative diseases associated with aging, and delay recovery from illness (Posner, 1979).

Anthropometric measurements:

In the present study, the anthropometric measurements of female and male subjects from selected residential zone were compared with measurements of female and male subjects from selected old age home (Table 4). According to assessment of anthropometric measurement, a significant difference was found in anthropometric measurements of both male and female elderly subjects from reselected residential zone and old age home of Kolhapur city. There is a significant difference was observed in BMI values of both male and female elderly subjects of the residential zone and old age home. The average BMI values of old age home elderly people were lower compared to the elderly subjects from selected residential zone. Pai (2011) also observed the similar findings, who noted that the elderly at home had higher BMI and higher MNA scores compared to those living in old age homes. Hwalla *et al.* (2003) have also shown that

elderly living at home had significantly higher mean BMI than those living in institutions.

The mean weight of male and female elderly subjects from selected residential zone was greater than male and female elderly subjects residing in old age home.

Clinical examination:

Clinical signs which are indicative of nutritional deficiency were observed during the clinical examination of the elderly study population. The clinical assessment had shown increased prevalence of clinical signs of vitamin A deficiency such as poor eye sight, dry skin and frequent infection from both the places. This is because of lower intake of green leafy vegetables and milk. The prevalence of iron deficiency and calcium deficiency was observed higher in elderly subjects residing in old age home compared to elderly subjects from residential zone. It is evident that more number of elderly female subjects had iron deficiency compared to male elderly subjects from both the places. Mohapatra *et al.* (2002) reported that iron deficiency, anaemia is a major nutrition deficiency problem along with poor socio-economic status in the elderly. The clinical signs of iodine deficiency were not reported by any elderly subject from both places.

Health related complaints:

Various diseases were also found in elderly subjects like diabetes, cardio-vascular diseases (hyperlipidemia/heart attack), hypertension, arthritis, osteoporosis, piles, renal disease like urinary calculi and asthma (Table 5). It was found that more number of elderly subjects were diabetic in residential zone compared to old age home. Osteoporosis and arthritis were mainly found in elderly females compared to elderly males. Maximum numbers of old age home elderly were hypertensive.

Table 5 : Average of various diseases present in elderly people

| Disease | Residential zone | | | | Total no. of elderly (a) | Old age home | | | | Total no. of elderly (b) |
|---|------------------|----------|--------|----------|--------------------------|--------------|----------|--------|----------|--------------------------|
| | Male | | Female | | | Male | | Female | | |
| | Freq. | Per cent | Freq. | Per cent | | Freq. | Per cent | Freq. | Per cent | |
| Diabetes | 13 | 52 | 6 | 24 | 19 (38) | 7 | 28 | 4 | 16 | 11(22) |
| Cardio-vascular diseases (hyperlipidemia, heart attack) | 5 | 20 | 7 | 28 | 12(24) | 3 | 12 | 3 | 12 | 6(12) |
| Hypertension | 8 | 32 | 14 | 56 | 22(44) | 17 | 68 | 11 | 44 | 28(56) |
| Arthritis | 1 | 4 | 9 | 36 | 10(20) | 2 | 8 | 8 | 32 | 10(20) |
| Osteoporosis | 9 | 36 | 13 | 52 | 22(44) | 7 | 28 | 16 | 64 | 23(46) |
| Piles | 1 | 4 | - | - | 1(2) | - | - | - | - | - |
| Ulcers | - | - | - | - | - | - | - | - | - | - |
| Renal diseases (urinary stone) | - | - | 1 | 4 | 1(2) | 3 | 12 | 2 | 8 | 5(10) |
| Cancer | - | - | - | - | - | - | - | - | - | - |
| Asthama | 2 | 8 | 3 | 12 | 5(10) | 4 | 16 | 1 | 4 | 5(10) |

Figures in parentheses indicate percentage

Conclusion:

It was concluded that there was a significant difference in dietary intake, anthropometric and clinical assessment between old age home elderly and elderly residing in their home. Nutritional status of elderly people residing in residential zone was much better as compared to elderly people residing in old age home. The elderly at old age home were posed at greater risk of severe health problems.

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