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# International Multidisciplinary Research Journal

## *Golden Research Thoughts*

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**RNI MAHMUL/2011/38595**

**ISSN No.2231-5063**

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## DIET PATTERN AND NUTRITIONAL STATUS OF RURAL ELDERLY

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**Abstract:-**There has been a steady increase in the proportion of elderly population in the world which is expected to reach more than 1.2 billion by 2025. Though there are various physical, psychological and social problems, nutritional problems play a major role in the health status of elderly. The elderly are at increased risk of malnutrition due to insufficient food intake and lack of quality of food. In this context this study attempt to assess the diet pattern and nutritional status of elderly and to identify the correlates of nutritional status of elderly. The study was carried out in three districts of Tamil Nadu and a total of 300 elderly were selected from each districts. A structured interview schedule consists of the diet pattern, anthropometric measurement and nutritional status was used to collect data from the elders. The study results indicates that a substantially higher proportion of male elders and higher of proportion of elders from high income family have followed good diet pattern compared to others. The nutritional status of elderly assessed based on the mini nutritional assessment schedule indicate that only 10.56 percent were well nourished. Significantly higher proportion of male elderly and literates were well nourished. Timely nutritional intervention at village level for a healthy ageing need to be initiated in order to make the older persons a happy and productive citizen.

**Keywords:** Diet Pattern , Rural Elderly , psychological and social problems.

### INTRODUCTION

There is a greater challenge posed upon us in the 21st century to delay the onset of disability and make sure the quality of life for elderly population as the proportion of elderly persons in the population of India deeply rose from 5.63 per cent in 1961 to 6.58 per cent in 1991 (Mishra U.S, et. al., 1999) and to 7.5 per cent in 2001 and it has been projected that they would constitute about 12 per cent of total population by 2030 (Irudaya R.S, et. al., 2003). Thus there has been a steady increase in the proportion of elderly population in India as a result of demographic transition (Irudaya R.S, 2003). In another estimate in India, the aged population constitutes about eight percent and expected to increase to 10 per cent in the year 2025. Though there are various physical, psychological and social problems, nutritional problems play a major role in the health status of elderly (Shankar & Sangeetha, 2011).

Advancing age pose a challenge to morphological and physiological function of a man. Old age is associated with ill health, physical and sensory impairment, heightened sensitivity and increased susceptibility to the diseases (Birren JE, & Schaic KW, 1996). The nutritional status of the elderly, particularly in the developing world, suffers disproportionately from natural disasters, war and conflict and related displacement, and also from the HIV/AIDS epidemic (Carta Miller and Barry Popkin, 2007).

The prevalence of chronic illness among the elderly in India is the major component of the burden which is associated with epidemiological transition facing a challenge of both communicable and non-communicable diseases where in nutrition plays an imperative role (Romieu I, 1997). Carta Miller and Barry Popkin (2007) propounded that good nutrition is important at every stage of life for maintaining good health and personal productivity; and it is especially crucial for the elderly because of the physiological changes that transpire in the body as people grow older. Even in the best of circumstances, aging deteriorates the immune system. More over factors such as insufficient calories, lack of protein and micronutrient deficiencies

in the elderly further decline their immunity and expose them to risk of infections (Dandekar K, 1993). The rising number of elderly population worldwide is warranting a challenging plan in addressing their nutritional needs (Carta Miller and Barry Popkin, 2007).

When the elderly people are poor, not consuming enough food regularly and unable to maintain sufficient calorie consumption is at risk (Bhattacharya et al. 2004). A study based on body weight in Taiwan and the Philippines established that underweight to be a more common feature among persons over 70, women, unmarried, rural residents, and the poor (Jenkins, et.al, 2007).

A number of researches have shown that elderly people who are underweight are at higher risk of acute illness and may even lead to bereavement (Beck et al. 1999; Kushner 1993; Marton et al. 1981; Seidell et al. 1996). There is also a significantly higher risk of dying within a year of hospitalization if the elderly lacks adequate nutritional status (Liu et al. 2002). Another study in Japan found a decline in dietary diversity to be associated with a reduction in functional ability (Kwon et al. 2006) and further the elderly may face difficulties because of social isolation, loss of spouse, or have problems of mobility (Gariballa 2004; Jenkins, et.al, 2007; Kwon et al. 2006; Zohoori, 2001). Moreover, older people who are undernourished face further risks, such as falls, hospitalization, lengthy hospital stays and complications at post-operative stage (Beck et al. 1999; Harris and Haboubi, 2005). Inadequate nutritional status linked with social conditions and mobility indicates the need to endorse healthy eating habits by a nutrition team in providing comprehensive health care of the elderly (Cristine Souza L.A, 2012).

In a clinical examination it has been reported that elderly patients who are institutionalized are especially at high risk of under-nutrition (Gariballa 2004; Morley 2001). The developing countries also face similar risk among elderly as some caregivers may intentionally withhold appropriate care (Zohoori 2001).

The old age people are associated with unique conditions due to physiological changes, as well as contracting of diseases and psycho-social economic and dietary factors that influence their nutritional status. United States, through the third National Health and Nutrition Examination Survey found that poverty has a very significant negative impact on micronutrient intake and nutrition status, as seventy-nine percent of those estimated to have inadequate food consumption lived below the poverty line (Sahyoun and Basiotis 2000). It is also found that the Hispanic elderly in the United States face the greatest risk of food insecurity associated with poverty (Bhattacharya et al. 2004).

Deficiency of nutrients can compromise the health of the elderly, leading to loss of muscle mass, poor wound healing, depression, reduced memory and dementia (Silveira EA, et. al., 2007). There is a need for regular periodic medical examination and treatment at the primary care level, which will help prevent further deterioration of their health status (Purty et. al., 2006)

In general, the elderly are at increased risk of malnutrition due to insufficient food intake and lack of quality of food. Hence an attempt is made in this study to assess the diet pattern and nutritional status of rural elderly in Tamilnadu, India.

## OBJECTIVES

- i. To assess the diet pattern of elderly in rural areas;
- ii. To assess the nutritional status of elderly;
- iii. To identify the correlates of nutritional status of elderly and
- iv. To suggest suitable measures to improve the nutritional status of elderly.

## METHODOLOGY

The data for the present paper is acquired from a large scale study on 'Health Condition and Care and Support available to elderly during sickness in Rural Tamil Nadu' conducted by the Department of Applied Research, Gandhigram Rural Institute (Deemed University) during October, 2007 to September, 2009 sponsored by Indian Council of Medical Research, New Delhi. The study was carried out in three districts of Tamil Nadu viz. Madurai, Karur and Villupuram, representing high, medium and low level of development districts as per the Tamil Nadu Human Development Report (2003). In each of the selected districts, three Primary Health Centres (PHCs) were selected based on their distance from the district Head Quarters. In the next stage, one sub-centre (SC) was selected at random from each of the selected PHCs and 100 elderly aged 60 years and above were selected using systematic random sampling method from each of the SC area. Thus a total of 300 elderly were selected from each of the selected districts. The total sample comprised of 900 elderly selected from the rural areas of the three selected districts of Tamil Nadu. The data were collected by trained research investigators by interviewing the respondents at their place of residence using a structured interview schedule. The data covered the diet pattern of elderly and nutritional status.

## RESULTS

### Type of food intake by the elderly

In order to assess the dietary pattern of the elderly, they were asked about the type of food they had taken at least once

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during the past one week before the survey. The results of the analysis of data presented in table 1 showed that legumes, cereals, beverages and vegetables were the main food taken at least once during the past one week by more than 90 per cent of both male and female elderly.

Nearly two third of both male and female elderly had taken fruits and about half of the elderly had taken meat. About one third of both male and female elderly had taken fish. Intake of egg was reported by 38.6 per cent of male and 40.9 per cent of female elderly. Intake of dairy product was reported by less than 30 per cent of both male and female elderly. Nuts and seeds were reported by 30.4 per cent of male and 37.4 per cent of female elderly and live cultures was reported by 27.8 per cent of male and 32.7 per cent of female elderly.

Type of food	Male				Female				Total			
	60-70 Yrs	70-80 Yrs	80-90 Yrs	Total N-414	60-70 Yrs	70-80 Yrs	80-90 Yrs	Total N-486	60-70 Yrs N-160	70-80 Yrs N-553	80-90 Yrs N-187	Total N-900
Egg	36.5	39.8	37.4	38.6	27.9	46.5	34.1	40.9	31.9	43.6	35.8	39.9
Dairy	20.3	27.8	33.3	27.8	19.8	26.0	21.6	24.1	20.0	26.8	27.8	25.8
Live cultures	44.6	29.9	41.4	35.3	25.6	34.6	33.0	32.7	34.4	32.5	37.4	33.9
Fish	45.9	33.6	25.3	33.8	25.6	32.4	33.0	31.3	35.0	32.9	28.9	32.4
Meat	60.8	44.8	40.4	46.6	51.2	51.9	48.9	51.2	55.6	48.8	44.4	49.1
Legumes	97.3	92.5	87.9	92.3	94.2	95.5	94.3	95.1	95.6	94.2	90.9	93.8
Cereals	100.0	99.6	97.0	99.0	98.8	100.0	100.0	99.8	99.4	99.8	98.4	99.4
Beverages	100.0	95.9	92.9	95.9	95.3	95.2	94.3	95.1	97.5	95.5	93.6	95.4
Sugar / confectionery	23.0	21.2	28.3	23.2	15.1	22.1	29.5	22.2	18.8	21.7	28.9	22.7
Vegetables	100.0	97.9	93.9	97.3	96.5	99.4	97.7	98.6	98.1	98.7	95.7	98.0
Nuts & seeds	36.5	25.7	37.4	30.4	43.0	36.9	34.1	37.4	40.0	32.0	35.8	34.2
Fruits	62.2	63.9	63.6	63.5	54.7	66.3	67.0	64.4	58.1	65.3	65.2	64.0

#### Diet pattern by selected background characteristics

The diet pattern of elderly is scored and based on the total score attained by each elderly. The diet pattern of elderly is grouped in to three categories as poor, moderate and good. Based on the grouping, the diet pattern of elderly by selected background characteristics is presented in table 2.

It is found that the diet pattern of elderly is poor for 11.7 per cent of elderly, moderate for 67.1 per cent and good for 21.2 per cent. It is observed that sex, marital status and family income are having significant association with the diet pattern of elderly. Significantly higher proportion of male elderly (23.2 per cent) is observed to have good food habit compared to female elderly (15.5 per cent). Higher proportions of married elderly (22.9 per cent) are having good food habit than single (19.9 per cent). The proportion of elderly who have good food habit increased significantly with the increase in income. It has increased from 14.9 per cent among elderly whose monthly family income is Rs.1000 or less to 27.2 per cent among those whose family income is Rs.4000 and above. Overall, the results indicate that good diet pattern is observed to be significantly more among male and those in high income families.

Table 2 Percent distribution of elderly by their diet pattern and selected background characteristics							
Background characteristics	N=900	Diet pattern			$\chi^2$	DF	P-value
		Poor	Moderate	Good			
<b>All</b>	<b>900</b>	<b>11.7</b>	<b>67.1</b>	<b>21.2</b>			
<b>Age (Years)</b>							
60 – 69	160	8.8	71.3	20.0	2.129	4	0.712
70 – 79	553	12.5	66.0	21.5			
80+	187	11.8	66.8	21.4			
<b>Sex</b>							
Male	414	14.3	62.6	23.2	8.152	2	<b>0.017*</b>
Female	486	9.5	71.0	19.5			
<b>Education</b>							
Illiterate	515	11.1	68.9	20.0	1.812	2	0.402
Literate	385	12.5	64.7	22.9			
<b>Marital status</b>							
Married	398	13.8	63.3	22.9	5.271	2	0.072
Single	502	10.0	70.1	19.9			
<b>Religion</b>							
Hindu	796	12.1	68.0	20.0	7.394	4	0.116
Muslim	58	6.9	63.8	29.3			
Christian	46	10.9	56.5	32.6			
<b>Caste</b>							
SC / ST	203	14.3	68.0	17.7	4.882	4	0.300
MBC	107	14.0	61.7	24.3			
BC	590	10.3	67.8	21.9			
<b>Family income (rupees)</b>							
= 1000	269	19.0	66.2	14.9	31.758	8	<b>0.000*</b>
1001 – 2000	205	11.7	65.9	22.4			
2001 – 3000	126	5.6	68.3	26.2			
3001 – 4000	103	10.7	66.0	23.3			
4001+	169	5.3	67.5	27.2			

\*Significant

**Nutritional status of elderly by living arrangement**

The nutritional status of elderly is assessed based on the Mini Nutritional Assessment (MNA) schedule developed by Nestle Nutrition Institute ([www.mna-elderly.com](http://www.mna-elderly.com)).

The percent distribution of elderly by their nutritional status and living arrangement is presented in table 3. Based on the MNA score, it is found that only 10.5 per cent of elderly are normal, 58.9 per cent of elderly are at risk of malnutrition and 30.6 per cent of elderly were malnourished. It is observed that significantly higher proportion of elderly living with unmarried children (68.7 per cent) are at risk of malnutrition compared to 61.9 per cent observed among those who are living with grandchildren, 59 per cent observed among those living with spouse and 56.1 per cent observed among those living with daughter's family.

Proportion of malnourished elderly is highest at 58.3 per cent among those who are living alone followed by 39.2 per

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cent among those who are living with daughter, 33.3 per cent among those who are living with grandchildren, 29.1 per cent among those who are living with spouse, 28.3 per cent among those who are living with son's family and 20.5 per cent among those who are living with unmarried children. The proportion of elderly having normal nutritional status is observed to be highest among those living with spouse and those living with unmarried children compared to others.

Living arrangement	Nutritional status			
	N	Malnutrition	At risk of malnutrition	Well nourished
All	900	30.6	58.9	10.5
Alone	24	58.3	41.7	-
With spouse	203	29.1	58.1	12.8
With unmarried children	83	20.5	68.7	10.8
With son's family	400	28.3	59.0	12.8
With daughter's family	148	39.2	56.1	4.7
With Grand children	42	33.3	61.9	4.8

**Nutritional status by selected background characteristics**

The nutritional status of elderly by selected background characteristics is presented in table 4. It is observed that age, sex, education, marital status and family income are having significant association with the nutritional status of elderly. The proportion of malnourished elderly increased significantly with age. Significantly higher proportions of male elderly are having normal nutritional status (13.8 per cent) compared to female elderly (7.8 per cent). The prevalence of malnutrition is significantly higher among illiterates (33.8 per cent) compared to literates (26.2 per cent). Significantly higher proportions of married elderly are having normal nutritional status (13.6 per cent) than single elderly (8.2 per cent). The prevalence of malnutrition significantly decreased with increase in family income. The prevalence of malnutrition decreased from 44.2 per cent among those who have a monthly family income of Rs.1000 or less to just 18.3 per cent among those who have a monthly family income of more than Rs.4000/-.

Table 4 Percent distribution of elderly by their nutritional status and selected background characteristics							
Background characteristics	N	Nutritional status			$\chi^2$	DF	P- value
		Malnutrition	At risk of malnutrition	Well nourished			
<b>All</b>	<b>900</b>	<b>30.6</b>	<b>58.9</b>	<b>10.5</b>			
<b>Age (Years)</b>							
60 – 69	160	26.9	62.5	10.6	30.794	4	<b>0.000*</b>
70 – 79	553	26.0	62.2	11.8			
80+	187	47.1	46.0	7.0			
<b>Sex</b>							
Male	414	29.2	57.0	13.8	8.401	2	<b>0.015*</b>
Female	486	31.7	60.5	7.8			
<b>Education</b>							
Illiterate	515	33.8	60.2	6.0	27.929	2	<b>0.000*</b>
Literate	385	26.2	57.1	16.6			
<b>Marital status</b>							
Married	398	29.4	57.0	13.6	6.864	2	<b>0.032*</b>
Single	502	31.5	60.4	8.2			
<b>Religion</b>							
Hindu	796	31.9	57.8	10.3	6.118	4	0.190
Muslim	58	19.0	69.0	12.1			
Christian	46	21.7	65.2	13.0			
<b>Caste</b>							
SC / ST	203	31.0	62.6	6.4	6.978	4	0.137
MBC	107	34.6	57.0	8.4			
BC	590	29.7	58.0	12.4			
<b>Family income (rupees)</b>							
= 1000	269	44.2	50.2	5.6	66.148	8	<b>0.000*</b>
1001 – 2000	205	32.2	56.1	11.7			
2001 – 3000	126	27.8	65.1	7.1			
3001-4000	103	15.5	74.8	9.7			
4001+	169	18.3	60.9	20.7			

\*Significant

### Discussion

The study carried out on a sample of a 900 elderly from the rural areas of Tamil Nadu brings out many interesting findings which are very much useful to the policy makers and programme planners to evolve appropriate programmes and strategies for the improvement in the nutritional status of elderly in rural areas.

The diet pattern of elderly assessed based on the type of food taken by them in the past one week indicate that the diet pattern of elderly is good only for 21.2 percent of elderly, moderate for 67.1 percent and poor for 11.3 percent. Higher proportion of male respondents and higher of proportion of respondents from high income family have followed good diet pattern compared to others. The nutritional status of elderly assessed based on the mini nutritional assessment schedule indicate that only 10.56 percent of elderly are well nourished, 58.9 percent are malnourished. Higher proportion of elderly living with spouse, unmarried children and married son are well nourished compared to those living with others. Proportion of



well nourished elderly decreased significantly with increase in age. Significantly higher proportion of male elderly is well nourished than female. Significantly higher proportions of literates are well nourished than the illiterates.

Marital status is also observed to be a significant factor in deciding the nutritional status of elderly. Obviously higher proportion of currently married elderly are comparatively well nourished than single elderly. Monthly family income seemed to be significantly influenced the nutritional status of elderly. Elderly belonging to higher income family (monthly income of Rs.4000 and above) are comparatively well nourished than those who have less monthly family income. Over all the study findings suggest that socio-economic status plays a vital role in the nutritional status of elders.

### CONCLUSION

The National Policy on Older Persons in India emphasized that there is a need to improve the health status of elderly in which nutritional status forms the significant part. Moreover there are various interventional strategies required to improve the health and nutritional status of elderly. The need of professionally trained manpower to meet the special health needs of the elderly is of great importance. Programmes for providing nursing care, counseling, healthy recreation, and meeting the personal and specific needs on individual basis would enhance the situation for a healthy aging. There need to be a timely intervention to help the elderly who are at risk of malnutrition or undernourished to overcome their nutritional deficiencies and this study also suggest that good dietary intake is essential for the improvement in the nutritional status of elderly irrespective of their various background characteristics. Hence, nutritional intervention is to be initiated at village level for a healthy ageing in order to make the older persons a happy and productive citizen.

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