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Statistics

NUTRITIONAL STATUS OF RURAL ELDERLY IN TAMIL NADU

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ABSTRACT Population ageing is an inevitable consequence of the demographic transition experienced by all the countries across the world. An extended life brings challenges on various physical, psychological and social grounds. The nutritional state is one of the major determinants of health status of elderly and hence plays major role in determining the quality of life. There is, however, little evidence to suggest that older people today are experiencing their later years in better nutritional status and health. In this context this study attempt to assess the nutritional status of elderly and to identify the correlates of nutritional status of elderly. The study was carried out in Dindigul district of Tamil Nadu with the intention to assess the nutritional status of rural elderly and a total of 450 elderly were selected. A structured interview schedule consists of the diet pattern, anthropometric measurement and nutritional status (MNA – SF) was used to collect data. The nutritional status of elderly assessed based on the anthropometric measurements indicate that 39.3 percent of elderly were in the state of malnutrition. The prevalence of malnutrition increases with age. Education status and economic status of elders are significantly associated with nutritional status. Health status, geriatric depression, health risk behavior status, and the activities of daily living status are significantly associated with the nutritional status of elderly. Adequate intervention on the nutrition level of elderly at village level needs to be initiated in order to make the older persons a prosperous and productive citizen.

KEYWORDS : MNA, Rural Elderly, Diet pattern, Activities of Daily Living status, health status, geriatric depression,

Introduction

Statistics clearly indicate life expectancy of the population increased across the world. Today, for the first time in history, most people can expect to live into their sixties and beyond. By 2050, the world's population aged 60 years and older is expected to total 2 billion, up from 900 million in 2015. Today, 125 million people are aged 80 years or older. By 2050, there will be almost this many (120 million) living in China alone, and 434 million people in this age group worldwide. By 2050, 80% of all older people will live in low- and middle-income countries.

The pace of population ageing around the world is also increasing dramatically. France had almost 150 years to adapt to a change from 10% to 20% in the proportion of the population that was older than 60 years. However, places such as Brazil, China and India will have slightly more than 20 years to make the same adaptation (WHO, 2015). India has around 104 million elderly persons of about 8.6% of the entire (Census 2011) and the number is expected to increase to 296.6 million constituting 20 per cent of the total population by 2050 (United Nations, 2015). An overwhelming majority of the elderly live in rural areas and there is an increasing proportion of old/oldest age category with feminisation of ageing being more pronounced at this age. Nearly three out of five single older women are very poor and about two-thirds of them completely economically dependent.

An extended life brings with it prospect, not only for older people and their families, but also for societies as a whole. Additional years provide the chance to pursue new activities such as further education, a new career or pursuing a long neglected passion. Older people also contribute in many ways to their families and communities. Yet the extent of these opportunities and contributions depends heavily on one factor: health. There is, however, little evidence to suggest that older people today are experiencing their later years in better health than their parents.

The nutritional state is one of the major determinants of the quality of life in the elderly and therefore, should be part of any geriatric assessment (Maaravi Y, et al., 2000). The underweight and overweight are the significant issues to be considered among the elderly population. (Inelmen EM et al., 2003).

Factors such as Physical or physiologic problems related to activities of daily living, chewing, digestion and absorption of food, lack of appetite, living arrangements, difficulty in preparing meals etc attribute in evidently to the nutritional status of elderly (Todays Res. Ageing, 2007). Health risk behaviours such as smoking, tobacco chewing, alcohol consumption etc. plays a vital role in constituting the healthier ageing. Also lifestyle behaviours, genetic syndromes, and health status also attribute significantly to their nutritional status (Conqueiro RS et al., 2010).

For some, good nutrition may become less important with age. Factors such as bereavement, social isolation can influence dietary practices. Cooking a proper meal for one takes time and may feel burdensome and as a consequence meals may become limited to snacks. Illness and disability may also affect the ability to shop for, and prepare food (Watson L. et al., 2006).

Studies show that level of nutritional status varies with various factors such as demographic, socio-economic, personal health status. The prevalence of risk of malnutrition among elderly varies from 25% to more than 50% at different countries and setup. The prevalence of risk of malnutrition was associated higher among the rural population and particulary the vulnerable portion of the population, the rural elderly women.

Thus, the purpose of this study was to examine the association between nutritional status and socio-economic status, living arrangements, healthy practices, health risk behavior, Activities of Daily Living, diet pattern status, and Physiological condition of rural elderly in southern Tamil Nadu according to Mini Nutritional Assessment.

Objectives

1. To assess the nutritional status of the rural elderly.
2. To determine the determinants of nutritional status of elderly in rural areas.
3. To suggest suitable measures to improve the nutritional status of the elderly and there by the health.

Methods

Area under Study

The study was carried out in the rural areas of Dindigul district representing the rural population of Tamil Nadu state, India by using Two-stage Cluster Sampling method. In the first stage, three blocks namely Nilakottai, Auttur and Sanarpatty in Dindigul district were selected at random. In the second stage, two villages each from the three blocks were chosen at random. After the selection of villages, all the elderly aged 60 years and above were listed for the preparation of the sampling frame. From the sampling frame, 75 elderly persons living in each village were selected using systematic random sampling procedure. Thus a total of 150 elderly were selected from each block that constituted a total of 450 elderly as samples.

Study Population

The main study population was elderly population aged 60years and above. Elderly were interviewed in their respective place of residence and besides them the care givers of elderly were also interviewed for precision of data. Thus the study population consists of local resident elderly population of aged 60 years and above and care givers of elderly.

Data Collection

A structured interview schedule was developed for the study. The interview schedule consisted of simple and short questions which could be easily understood and answered by the elderly. The interview schedule, covered a range of subjects which included the living arrangement of elderly, economic status, family relationship, personal life style, Mini Nutrition Assessment (MNA), physiological status, health status, geriatric depression, Activities of daily Living (ADL), Diet pattern, community and governmental support available to elderly in rural Tamil Nadu. The data were collected during the period from June to November 2015 by personally contacting the elderly at home.

Nutritional Status

The nutritional status of elderly is assessed based on the Mini Nutritional Assessment (MNA) schedule developed by Nestle Nutrition Institute (www.mna-elderly.com). Anthropometric measurements such as Body Mass, height and weight were measured for the elderly following standard procedures and using calibrated equipment. Mean values of these measurements were considered in the analyses.

Statistical Procedure

Both univariate and multivariate analysis were carried out to assess the nutritional status among elderly in rural areas and also to determine the various socio-economic and health care determinants of elderly in rural areas. The test of chi-square was used to find the significance of the relationship between the independent and dependent variables. The means, standard deviation and cross tabulation tables were used as descriptive statistics. Pearson's correlation coefficient was applied in correlation analysis. Multivariate analysis with multinomial logistic regression was used to determine the intensity of the relationship between qualitative and quantitative independent variables with dependent variables.

Results

Background Characteristics of Elderly

Table 1 : Percent Distribution of Elderly by Sex and Selected Background Characteristics

Background Characteristics	Male N = 205	Female N = 245	Total N = 450
Age (Years)			
60-69	42.9	56.7	50.5
70-79	39.1	33.1	35.8
80+	18.0	10.2	13.7
Educational Status			
Illiterate	37.6	66.5	53.3
Literate	62.4	33.5	46.7
Religion			
Hindu	63.9	60.8	62.2
Others	36.1	38.2	37.7
Community			
SC	24.9	25.3	25.1
BC	51.7	49.4	50.4
MBC	23.4	25.3	24.4
Marital Status			
Married	70.2	35.5	51.3
Single	29.8	64.5	48.7
Family Type			
Nuclear	77.1	66.5	71.5
Joint	22.9	33.5	28.5

Nutritional Status of Elderly

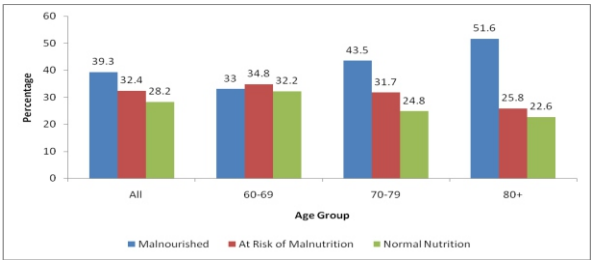
The nutritional status of elderly determined by their MNA scores by selected background characteristics is presented in table 2. The proportion of malnourished elderly is found to be of 39.3 percent followed by 32.4 percent of them at risk of malnutrition and 28.2 percent of elderly are found to be at normal nutritional status. The analysis with respect to age group shows that major proportion of malnourished elderly are found among the oldest age group of 51.6 percent followed by age group 70-79 years of 43.5 percent and 33.0 percent among age group 60-69 years.

Table 2. Percent Distribution of Elderly by Nutritional Status and Age group

Age Group	N	Nutritional Status			χ2	DF	P - Value
		Malnourished	At Risk of Malnutrition	Normal Nutrition			
All	**450**	**39.3**	**32.4**	**28.2**			
60-69	227	33.0	34.8	32.2	9.222	4	**0.056****
70-79	161	43.5	31.7	24.8			
80+	62	51.6	25.8	22.6			

*P<0.05 **P<0.10

Figure 1. Percent Distribution of Elderly by Nutritional Status and Age group



The analysis on nutritional status shows that the prevalence of malnutrition among the rural elderly is of 39.3 percent and the risk of malnutrition is of 32.4 percent and normal nutrition is of 28.2 percent. It is found that the level of malnutrition increases with increase in age and found inverse relation with normal nutritional status. Hence the age factor independently can be regarded as the determinant of nutritional status of elderly.

Further analysis on nutritional status of elderly according to their background characteristics is presented in table 3. The results reveals the fact that male was predominantly malnourished on the overview while female at the oldest age are found to have more prevalence to be undernourished. Similarly religion is not found its significance in determining nutritional status at the entirety level whereas shows some evidence at individual age groups that elderly of other religion was disadvantaged to be malnourished.

The prevalence of malnutrition is higher among elderly from MBC and SC community at the entirety level and youngest age group and shows some significance in towards the hypothesis that communal imbalance plays vital role in determining the nutritional status.

It is found that illiterate elderly are disadvantaged to be malnourished and literate elderly are comparatively privileged to be of normal nutritional status at both entirety and at all age groups. Hence the educational status can be regarded as the important determinant in determining the nutritional status of elderly. Type of family do not explicit much evidence on the effect over nutritional status of elderly.

Past occupation type shows significant association with nutritional status where elderly from agriculture and coolie occupation is found to be the major donor to the share of malnourished elderly. Hence it is inevitable that past occupation play major role in determining nutritional status of elderly. No significant evidence on the effect of current occupational status on the nutritional level of elderly is enunciated.

Table 3. Percent Distribution of Elderly by Nutritional Status and Age group to their Selected Background Characteristics

Background characteristics	N	Nutritional Status			χ2	DF	P - Value
		Malnourished	At Risk of Malnutrition	Normal Nutrition Status			
All	**450**	**39.3**	**32.4**	**28.2**			
Sex							
Male	205	41.5	28.3	30.2	2.98	2	0.225
Female	245	37.6	35.9	26.5			
Religion							
Hindu	280	38.9	33.2	27.9	0.201	2	0.904
Others	170	40.0	31.2	28.8			
Community							

SC/ST	113	42.5	38.0	19.5	10.508	4	**0.033**
MBC	110	42.7	33.6	23.7			
BC	227	36.1	29.1	34.8			
Education Status							
IIIiterate	240	42.1	36.2	21.7	11.116	2	**0.004**
Literate	210	36.2	28.1	35.7			
Type of Family							
Nuclear	321	38.3	34.3	27.4	1.7	2	0.427
Joint	129	41.9	27.9	30.2			
Past Occupation							
Coolie	309	41.5	36.2	22.3	24.277	8	**0.002**
Business/Self Employed	39	25.6	25.6	48.8			
Own Agriculture	50	48.0	20.0	32.0			
Salaried	29	31.0	27.6	41.4			
House Wife	23	26.1	26.1	47.8			
Current Job							
Yes	185	35.7	35.1	29.2	1.874	2	0.392
No	265	41.9	30.6	27.5			
Individual Income (Rs.)							
≤ 2000	211	44.1	32.2	23.7	14.683	6	**0.023**
2001-4000	76	26.3	40.8	32.9			
4001+	59	33.9	23.7	42.4			
Not Applicable	104	42.3	31.7	26.0			
Family Income (Rs.)							
≤ 5000	233	41.2	33.0	25.8	6.025	6	0.420
5000-10000	124	34.7	32.3	33.0			
10001+	68	41.1	26.5	32.4			
Don't Know	25	40.0	44.0	16.0			
Economic Status							
Low	156	53.2	26.3	20.5	39.257	4	**0.000**
Medium	155	38.7	40.0	21.3			
High	139	24.5	30.9	44.6			

The proportion of malnutrition is higher among lowest earning quintile including not applicable and the highest earning quintiles are observed among both in individual and family income. Significant evidence on the rejection of hypothesis that higher the income and higher the nutritional status is observed in the present study. Substantial evidence over the hypothesis that higher the economic status is higher the nutritional status is enunciated from the present study. The association is found strong and significant at aggregate level and across all age groups.

The results on the nutritional status of elderly according to their associated factors are presented in table 4. Health risk behavior exhibit linear relationship with level of malnutrition whereas medium group in health risk behavior status dominates the level of other nutritional status. It is observed from the results that higher the risk behavior status is higher the risk of malnutrition.

The level of malnourishment is found to be decreasing with increase in the level of healthy behavior status and concurrent incremental in the nutritional status is also observed in the present study. Significant association among these factors both at aggregate and individual age group level shows sufficient evidence to consider the healthy behavior status as the determinant of nutritional status of elderly.

As anticipated level of malnutrition is much higher among those elderly with poor ADL status and concurrently higher proportion of normal nutrition is observed among elderly good in their ADL status. Strong and significant association among ADL and nutritional status is observed and hence can be regarded as the determinant of nutritional status of elderly. Also the present situation anecdote the hypothesis that higher the ADL status is higher the level of nutritional status.

Table 4 . Percent Distribution of Elderly by Nutritional Status and Age group to their Selected Associated Factors

Associated Factors	N	Nutritional Status			$\chi 2$	DF	P - Value
		Malnourished	At Risk of Malnutrition	Normal Nutrition Status			
Health Risk Behaviour Status							
Low	177	38.4	30.5	31.1	5.797	4	0.215
Medium	129	33.3	36.5	30.2			
High	144	45.9	31.2	22.9			
Healthy Practice Status							
Low	203	47.3	28.7	24.0	15.161	4	**0.004**
Medium	175	34.3	38.3	27.4			
High	72	29.2	29.2	41.6			
ADL Status							
Severe Impairment	39	66.7	12.8	20.5	26.823	4	**0.000**
Moderate Impairment	111	50.5	29.7	19.8			
Full Function	300	31.7	36.0	32.3			
Diet Pattern Status							
Poor	196	48.5	30.1	21.4	24.285	4	**0.000**
Moderate	163	38.0	35.0	27.0			
Good	91	22.0	33.0	45.1			
Geriatric Depression							
Severe	199	46.7	30.7	22.6	10.401	4	**0.034**
Moderate	201	34.8	33.8	31.3			
Mild	50	28.0	34.0	38.0			
Health Status							
High Risk	156	54.5	27.6	17.9	33.283	4	**0.000**
Moderate	146	38.4	34.9	26.7			
Low Risk	148	24.3	35.1	40.5			

In par with several other studies the present study also reveals the strong and significant of level of depression with nutritional status of elderly both at aggregate and individual age group level. Also the present study verified the fact that increase in the level of depression is the increase in the level of malnutrition and exerts inverse relation on normal nutritional status. Hence the geriatric depression status can be regarded as the determinant of nutritional status of elderly.

Table 5. Multinomial Logistic Regression Analysis on Nutritional Status of Elderly

Background characteristics	Reference Category	Malnutrition		
		Odds Ratio	95 % CI	P - Value
Age of Respondents (years)	60-69			
70-79		1.559	1.03 - 2.37	**0.037**
80+		2.162	1.22 - 3.82	**0.008**
Sex	Male			
Female		0.849	0.58 - 1.24	0.398
Religion	Hindu			
Others		0.956	0.65 - 1.41	0.822
Community	BC			
MBC		1.319	0.83 - 2.10	0.243
SC/ST		1.306	0.82 - 2.07	0.257
Education Status	IIIiterate			
Literate		0.781	0.53 - 1.14	0.202
Type of Family	Nuclear			
Joint		1.159	0.77 - 1.76	0.487
Current Job	Yes			
No		1.300	0.88 - 1.91	0.185
Individual Income (Rs.)	≤ 2000			
2001-4000		0.453	0.25 - 0.80	**0.007**
4001+		0.651	0.36 - 1.19	0.163
Not appicable		0.953	0.58 - 1.49	0.766
Family Income (Rs.)	≤ 5000			
5000-10000		0.758	0.48 - 1.19	0.229
10001+		0.999	0.58 - 1.73	0.997

Not Known		0.951	0.41 - 2.20	0.908
Economic Status	High			
Medium		1.950	1.18 - 3.23	**0.009**
Low		3.511	2.13 - 5.78	**0.000**
Health Risk Behaviour Status	Low			
Medium		0.801	0.50 - 1.29	0.361
High		1.356	0.87 - 2.12	0.181
Healthy Practice Status	High			
Medium		1.267	0.70 - 2.30	0.437
Low		2.179	1.22 - 3.88	**0.008**
ADL Status	Full Function			
Moderate Impairment		2.197	1.41 - 3.43	**0.001**
Severe Impairment		4.316	2.12 - 8.77	**0.000**
Diet Pattern	Good			
Moderate		2.179	1.21 - 3.93	**0.009**
Poor		3.339	1.89 - 5.90	**0.000**
Geriatric Depression	Mild			
Moderate		1.374	0.70 - 2.72	0.361
Severe		2.256	1.15 - 4.44	**0.019**
Health Status	Low			
Moderate		1.936	1.17 - 3.20	**0.010**
High		3.725	2.23 - 6.08	**0.000**

Significant association was found among health status and nutritional status of elderly both at totality and individual age group level. The level of malnutrition is found common among elderly with high risk in their health status and is found linearly associated among all age groups of elderly. Hence the present results append value to the hypothesis that higher the health status is higher the nutritional status and vice versa.

The results on the multinomial logistic regression analysis on malnutrition to their associated variables are presented in table 5. The multinomial logistic regression identified several variables as important determinants of all levels of nutritional status. The results indicate that the factors such as age, level of income, economic status, healthy practice status, health status, level of depression, ADL status, and diet pattern status explicit best fit to the model and the association is found significant.

Discussion

Gap in the equity in distribution and availability of money remains sparse in the diversified country such as India and are explicated in the present study. Equality in the society towards education, morality yet found to be improved. The efforts of Governments on the housing through their interventions are appreciable and yet the efficacy still relies on other factors based on their livelihood.

The practice of life style behavior was poor among rural elderly and in particular male elderly are more exposed to health risk practices. Healthy practices are found to be having direct effect on nutritional and health status in the present study and are found very less among rural elderly. The trend in Leisure time activities have changed with increase in age. Agriculturalists and agricultural laborers are more disadvantaged to be at poor health risk status and are to be addressed.

The dependency level increases with age much higher among female and increases the vulnerability. The severe impairment status is found higher at the oldest age group and higher among male. Elderly with high health risk status and low healthy practices are found higher among severe functional impairment. This changing situation poses a challenge for policy makers in the provision of care and support at all means and to derive the appropriate policies to promote healthy practices and restrict intake of harmful substances.

The level of intake of nutritional food such as fish, meat, egg, and legumes yet found less among rural elderly. Disparity in the consumption of food items is apparent in the present study. The level of good diet status decreases with increase in age. Economic status and healthy practice status shows significant effect in determining the level of diet status. These conditions create the gap to be redressed by the Government by means of awareness and supplementation for those at need.

The level of depression increases with age and are higher among female at the oldest age group. Education and level of income along with family support provides some evidence in bringing down the level of depression among the aged. The condition emerges scope for the society to initiate the traditional value and to provide appropriate measure on the retardation of mental health.

The health problems of rural elderly exhibit different pattern than urban elderly. Chronic diseases show different pattern with age than those diseases associated with ageing. Proportion of elderly suffering with diseases was higher among female. The conditions such as poverty, lack of mobility, inadequate and inaccessible health care services, poor in healthy practices, higher in health risk practices and lack of family support, increases the chances of the elderly to be vulnerable to many health and psychological problems at older ages.

The prevalence of malnutrition among elderly is of 39.3 percent and higher at the oldest age group. Female is more disadvantaged to be malnourished at the oldest age group. Educational status and income status are found to be directly associated in determining the nutritional status of elderly. The cyclic factors such as healthy practices, ADL status, diet pattern status, level of depression, and health status exhibits sufficient evidence on the impact over nutritional status. Hence there is a need for community based health care services to meet the requirements of vulnerable elderly in rural areas.

Conclusion

Elderly in India needs the protection of an integrated national policy for the aged. National policy should recognize the potential of aged and negative perceptions of elderly as economic burden to be replaced with positive image. Policy must be adopted to meet the diverse needs of subgroups based on residence, sex, education and opportunities. There is a need for high level organization to protect and promote the needs of elderly in rural India. The findings of the study suggest that the existing programmes for the welfare of the aged must focus on health by reducing risky substances and promoting healthy practices and adding values in the health care system by Geriatric medicine section in rural area and bringing out opportunities for the growing elderly population

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