

Original Article

Assessment of the nutritional status of the elderly and its correlates

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ABSTRACT

Background: The percentage of elderly is growing rapidly and malnutrition is not uncommon in the elderly. **Objectives:** The present study was carried out to assess the nutritional status of the elderly using the Mini Nutritional Assessment (MNA) tool, and to study the various epidemiological factors influencing their nutritional status. **Materials and Methods:** This cross-sectional study was done from July 2012 to August 2013 in Boko-Bongaon Block, Kamrup District, Assam, India. The elderly, those over 60 years of age, who met the inclusion criteria participated in the study. A total of 30 clusters were selected and 12 elderly from each cluster were taken to achieve the desired sample size of 360. Nutritional status was assessed by the MNA tool and a 24-h dietary recall method. **Results:** Out of the total of 360 elderly persons, 15% were found to be malnourished and 55% were at risk of malnutrition. The association between nutritional status and older age group, female gender, dependent functional status, dependent financial status and inadequate calorie intake was found to be significant. **Conclusion:** The present findings reveal that malnutrition is not an uncommon problem in the elderly, and further studies are needed in this regard.

Key words: Calorie intake, elderly, Mini nutritional assessment tool, nutritional status

INTRODUCTION

The percentage of the elderly is growing rapidly worldwide. The global number of the elderly is projected to rise from an estimated 524 million in 2010 to nearly 1500 million in 2050, with most of this increase in developing countries.^[1] The factors underlying this transition are increased longevity, declining fertility, and aging of “baby boom” generations.^[2]

There is no United Nations (UN) standard numerical criterion, but the UN agreed cutoff is 60+ years when referring to the elderly population. India’s elderly population is also growing rapidly and accounted for 8.1% of total population in 2011.^[3] Such a rapid rise in the elderly

population will definitely pose several challenges. The lack of guaranteed sufficient income to support themselves, the absence of social security, loss of social status and recognition, unavailability of opportunities for creative use of time and persistent ill health are some of the daunting problems the elderly face in the country.^[4] This increases the demands on the care givers, the society and the health services of a country.

Older people are vulnerable to malnutrition for many reasons including physiological and functional changes that occur with age, lack of financial support and inadequate access to food. The functional status of the elderly is their ability to carry out their day to day activities including preparation of food and intake, thereby affecting nutritional status. In India, the problem of the health of the elderly is compounded by poor nutrition together with medical issues, including both communicable and noncommunicable diseases. Malnutrition and morbidity create a vicious cycle.

The nutrition and health of the elderly is often neglected. Most nutritional intervention programs are directed toward infants, young children, adolescents, and pregnant and

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lactating mothers. However, nutritional interventions could play a part in the prevention of degenerative conditions of the elderly and an improvement of their quality of life. A timely intervention can stop weight loss in those at risk of malnutrition. Unfortunately, not much explanation has been given for the precise estimate of under-nutrition in this age group in research. An evaluation of nutritional status is important for the creation of a database to assist with the initiation of important programs and formulation of policies.

The Mini nutritional assessment (MNA) tool is a well-validated tool for assessing malnutrition in the elderly. The tool was shown to have an accuracy of 92% when it was compared with a clinical evaluation by two physicians specialists in nutrition, and 98% when it was compared with a comprehensive nutritional assessment, including biochemical tests, anthropometric measurements and dietary assessment.^[5]

The present study was carried out to assess the nutritional status of the elderly using the MNA tool, and to study the various factors influencing their nutritional status.

MATERIALS AND METHODS

This cross-sectional study was undertaken in Boko-Bongaon block, Kamrup district, Assam, India, which is a field practice under the department of Community Medicine, Gauhati Medical College. The study was conducted from July 2012 to August 2013.

Study population

All the elderly above 60 years of age residing in the villages under the Block for longer than 6 months were included in the study. Those who were seriously ill, fed by tube and with known neuropsychiatric illness, and living alone were excluded from the study.

Considering the prevalence of chronic energy deficiency as 50%^[6] and a relative error as 15% of prevalence, with 95% confidence interval, and a design effect of 2, the sample size was calculated as 360. The 140 villages (Census 2001) under the Boko-Bongaon Block were taken as the primary sampling unit in the study under cluster methodology. A total 30 clusters were selected, and 12 elderly persons from each cluster were taken to get the desired sample size of 360 elderly people. In each selected household, all the elderly who met the inclusion criteria were made part of the study. Information was verified by the care givers wherever necessary. The primary tool in this study was a predesigned and pretested schedule.

A 24-h dietary recall method was used to assess the calorie intake of the elderly. The calorie requirement was calculated by using recommended dietary allowances (RDA) 2010 guidelines as per the weight of the elderly.^[7] Adequate calorie intake per 24-h has been defined as the intake of calories as recommended per kg body weight as per RDA 2010 guidelines.

Nutritional status assessment was done by MNA tool. Interpretation of scores was done as follows: Score <17: Malnourished, Score 17-23.5: At risk of malnutrition and Score >23.5: Well nourished.^[8]

All of the elderly in the present study went through the complete MNA assessment irrespective of the MNA screening score. Anthropometric examination was done for height, weight, mid upper arm circumference and calf circumference. Weight and height were measured by using standardized weighing machine and stadiometer respectively. Weight was measured to the nearest 0.1 kg and height to the nearest 0.1 cm. For the elderly with spinal curvatures, arm length was used to estimate height.

The elderly who were self-earning, getting pensions, had savings or getting rent for a house were considered financially independent.

For the assessment of functional status activities of daily living and instrumental activity of daily living was evaluated by Katz^[9] and Lawtons index^[10] respectively. Based on the self-reporting, the elderly who needed help with one or more items were assigned to the functionally dependent group. In order to find out the association of important variables with nutritional status, only those who fell into the categories of the well-nourished and malnourished by the group of MNA scoring were included. Those who fell into the "At risk" category were excluded. Ethical clearance was taken from the institutional ethics committee. Informed consent was taken from the participants before commencing the study.

Statistical analysis

Analysis of data was performed using Microsoft Office Excel 2007. Analysis for qualitative variables was done using Chi-square test.

RESULTS

Table 1 summarizes the nutritional status of the elderly as determined by the MNA tool. Of the 360 elderly, 15% were found to be malnourished, 55% were at risk of malnutrition and 30% were found to be well nourished.

A significant association was found between the nutritional status and the older age groups, female gender, status of being financially and functionally dependent. No significant association was found between living status and nutritional status [Table 2].

Table 3 illustrates the significant relationship found between nutritional status and calorie intake. Out of the 360 elderly persons, 190 (52.7%) were found to have inadequate calorie intake.

Various reasons cited for the inadequate calorie intake were problems of chewing and swallowing (59.5%), some complained of loss of appetite (54.2%), some indicated they could not afford it (48.4%), for some, decisions regarding food intake was taken by caregivers (47.8%) and 38.4% elderly were unaware [Table 4].

Table 1: Distribution of respondents as per MNA score

MNA status	Frequency	Percentage
Well nourished	108	30
At risk	198	55
Malnourished	54	15
Total	360	100

MNA: Mini nutritional assessment

DISCUSSION

The study revealed that 15% of the elderly were malnourished and 55% were at risk according to the MNA scoring. In their study done in rural Tamil Nadu, Vedantam *et al.*^[11] found that 14% of the elderly were malnourished. Ferdous *et al.*,^[12] Baweja *et al.*^[13] and Saka *et al.*^[14] also had similar results in their studies. However, the study conducted by Saeidlou *et al.* in a nursing home in Iran (2008)^[15] observed that a considerably higher percentage (49.6%) of the elderly were malnourished. This could be due to the difference in profiling and characteristics of the study population.

In an attempt to study the relationship of different variables with nutritional status, a significant relationship was observed between age groups and MNA status. A similar observation between age group and nutritional status was also made in the studies done by Baweja *et al.* and Wadhwa *et al.*^[16] in rural Rajasthan.^[13] The association between MNA status and gender was found to be statistically significant. This could be attributed to factors such as the role of women in the society and financial dependency which eventually affects nutritional status. Studies done by Saeidlou *et al.*,^[15] Donini *et al.*^[17] and Boulos *et al.*^[18] also found significant associations between female gender and

Table 2: Association of socio-demographic variables and functional status with nutritional status

Sociodemographic variables	Nutritional status			P
	Well nourished (n=108) n (% row wise)	Malnourished (n=54) n (% row wise)	Total n (%)	
Age group				
60-75 (young old)	77 (85.6)	13 (14.4)	90 (100)	<0.05
75-85 (old old)	24 (60)	16 (40)	40 (100)	
>85 (very old)	7 (21.9)	25 (78.1)	32 (100)	
Gender				
Males	65 (78.3)	18 (21.7)	83 (100)	<0.05
Females	43 (54.4)	36 (45.6)	79 (100)	
Living status				
With spouse	22 (62.9)	13 (37.1)	35 (100)	>0.05
With children	33 (73.3)	12 (26.7)	45 (100)	
With spouse and children	39 (70.9)	16 (29.1)	55 (100)	
Only relatives	14 (51.9)	13 (48.1)	27 (100)	
Financial status				
Independent	84 (79.2)	22 (20.8)	106 (100)	<0.05
Dependent	24 (42.9)	32 (57.1)	56 (100)	
Functional status				
ADL status				
Independent	89 (80.2)	22 (19.8)	111 (100)	<0.05
Dependent	19 (37.3)	32 (62.7)	51 (100)	
IADL status				
Independent	60 (80)	15 (20)	75 (100)	<0.05
Dependent	48 (55.2)	39 (44.8)	87 (100)	

Statistically significant at $p < 0.05$. N.B. Analysis of different variables with nutritional status was only done for the elderly included in well-nourished and malnourished group, therefore $n=162$. ADL: Activities of daily living; IADL: Instrumental activities of daily living

Table 3: Relationship of calorie intake with nutritional status

Calorie intake	Nutritional status (n (% row wise))		Total	P
	Well nourished (n=108)	Malnourished (n=54)		
Adequate	71 (78.9)	19 (21.1)	90 (100)	<0.05
Inadequate	37 (51.4)	35 (48.6)	72 (100)	

Statistically significant at $p < 0.05$. Elderly at risk were excluded during analysis

Table 4: Reasons cited for inadequate calorie intake

Reasons cited	Frequency (n=190)	Percentage
Chewing and swallowing problems	113	59.5
Complained of loss of appetite	103	54.2
Not able to afford	92	48.4
Decision was taken by care givers	91	47.8
Elderly were unaware	73	38.4

Multiple reasons were cited. Total elderly not taking adequate calorie intake, n=190 (elderly falling in the "at risk" category were also included). Statistically significant at $p < 0.05$

nutritional status. No significant association was found between living status and nutritional status, which was in consonance with studies done by Boulos *et al.* in Lebanon^[18] and Saikia and Mahanta in Guwahati, Assam.^[19] However, studies have shown that malnutrition was more prevalent among the elderly who lived alone.^[15] None of the elderly in the present study lived alone.

An analysis of the relationship of financial dependency with nutritional status revealed a significant association. The intake of food is determined by the purchasing power, and moreover a person can be decisive about food intake if he or she is financially independent. Some studies similarly found that not having an income and not receiving regular financial support were associated with poor nutritional status.^[12,19-21]

The functional status of the elderly determines their ability to perform basic self care tasks and live independently, which also includes food intake. The association between functional and nutritional status was found to be significant and the corroborated other studies.^[22-24] There was significant association between calorie intake and nutritional status. Similar observations were also revealed by Vedantam *et al.* in their study in South India.^[11] The most common reasons cited for inadequate calorie intake were difficulty in chewing and swallowing (59.5%), and loss of appetite (54.2%). The inability of elderly to take decisions about food intake (47.8%), lack of funds (48.4%) lack of awareness (38.4%) were other reasons cited. Physical and financial dependency thus definitely influenced nutritional status.

This study had some limitations. No assessment of biochemical parameters of nutritional status and hemoglobin were done because of constraints of resources. It was also not possible to look into morbidities which might affect nutritional status.

CONCLUSIONS AND RECOMMENDATIONS

The overall prevalence of malnutrition was found to be 15%, but the alarming fact is that the proportion of elderly at risk of malnutrition was relatively very high (55%). Calorie intake was found to be inadequate for the various reasons cited. Therefore, it is necessary to raise awareness of the elderly and their caregivers about the quality, quantity and frequency of food intake of older persons. Those found to be at risk of malnutrition or malnourished were counseled and referred for appropriate intervention. However, a multidimensional approach is required at this moment to deal with these issues. Efforts should be initiated to help the elderly to adopt healthy life style practices to maintain or improve their functional status. Further studies are needed to generate a database for effective policy making and planning for interventions.

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