## **Original Research Article**

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# To assess the nutritional status among elderly and factors influencing it, in an urban area, Bengaluru - a cross sectional study

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#### **ABSTRACT**

**Background:** Elderly population is on raise globally and in India. Malnutrition in old age, significantly increases the susceptibility to infection, compromises the outcomes of other underlying conditions and diseases and hence increases the risk of morbidity and mortality. The malnourished elderly are more likely to require more hospitalizations, cause burden to caregivers and possess a huge economic cost to society. This facilitates the need for early detection of malnourishment among elderly by assessing the nutritional status as a part of geriatric evaluation therefore appropriate measures can be taken to overcome the malnourishment and associated complications. Hence this study attempts to assess the nutritional status and factors influencing it among elderly, in an urban area, Bengaluru.

**Methods:** A cross-sectional study was conducted among 300 elderly population aged  $\geq$ 60 years in an urban area, Bengaluru during April to August 2016.

**Results:** Among the study participants majority 182 (60.66%) were females and 64(21.33%) were malnourished. Nutritional status was found to worsen significantly with advancing age ( $\chi^2$ =42.12, P value <0.0001), Illiteracy ( $\chi^2$ =16.19, P value 0.0003), dependent financial status ( $\chi^2$ =16.45, P value 0.0003) and living arrangements without spouse and/or children ( $\chi^2$ = 14.17, P value 0.0278). Good awareness but low utilization levels of the old age social security scheme was noted among the study population.

**Conclusions:** Old age can only be protected, promoted and extended by adding quality to life. Geriatric nutritional status assessment helps to detect the malnourished and those at risk of malnutrition at an early stage, following which an early corrective interventions can improve their quality of life.

Keywords: Nutritional status, Elderly, Mini nutritional assessment scale

## INTRODUCTION

On an account of better education, better health facilities and increase in life expectancy there is an unprecedented increase in human longevity. The population of elderly is on a raise, both in developed and developing countries and has resulted in the phenomenon of demographic revolution characterised by increase in number and proportion of older persons worldwide, this transition is predicted to continue well into the coming decades.<sup>1</sup>

In India the percentage of elderly population (60+) accounts to about 8.0 percent, constituting 104 million with 53 million females and 51million males during 2011 census.<sup>2</sup> It is projected to increase to 133.32 million (2021), 178.59 million (2031), 236.01 million (2041) and 300.96 million (2051). India's older population will increase dramatically over the next four decades.<sup>3</sup> The share of India's population ages 60 and older is projected to climb from 8 percent in 2010 to 19 percent in 2050,

according to the united nations population division (UN 2011).<sup>4</sup>

Aging is associated with various physiological changes and needs, which make elderly people vulnerable to malnutrition.<sup>5</sup> Traditionally, food intake tends to decrease with advancing age to compensate for the diminished energy needs associated with lowered physical activity and basal metabolic rate. Old age is also associated with deterioration of health because of decreased resistance to diseases in the body following ageing process.<sup>6</sup> The cumulative effect of the interaction between decreased and changes seen in aging to progressive under-nutrition, which often goes undiagnosed.

A high prevalence of malnutrition (variable between 15-60%) in older adults has been reported worldwide. In order to maintain good nutritional status and prevent development of malnutrition, continuous monitoring of health and nutritional status is important. According to WHO, traditional measurements of nutritional status assessment may fail to provide true picture of nutritional status in older people.<sup>6</sup>

Although various dietary intake assessment methods are available, they do not reflect comprehensive information. Mini nutritional assessment (MNA) has been observed to be such a tool which provides a single and rapid assessment of nutritional status in older people in clinical as well as in home based settings.

Nutritional status assessment using the MNA tool with 18 questions has.

Anthropometric assessment: height & weight (BMI), arm and calf circumferences.

General assessment: lifestyle, medication and mobility.

*Dietary assessment:* food & fluid intake, autonomy of feeding and number of meals.

Subjective assessment: self-perception about health and nutrition.

Scoring system ranged from 0 to 30 which categorizes subjects as normal/having adequate nutritional status (score ≥24 points), border line/at risk of malnutrition( undernutrition, score 17 to 23.5) and malnourished/ undernourished (score ≤17 points).

It is the most efficient, simple and appropriate nutritional assessment tool for older people, where a physician / dietician / nurses can detect malnutrition or at risk of malnutrition before severe weight or albumin loss is present and favours early nutritional intervention in order to improve quality of life.<sup>8</sup>

Indira Gandhi national old age pension scheme (IGNOAPS) is a scheme which provides a monthly pension to elderly aged 60 years and older. Awareness and utilization patterns about the scheme in-turn can influence their financial status and nutrition of the elderly. Loneliness, lack of income, employment status, living arrangements, decreased physical activity and other factors can affect the nutritional status of elderly subjects.

Early detection of malnutrition is important since it has been associated with diminished cognitive function, mobility and a diminished ability to care for one's self. Therefore, nutritional assessment of the elderly persons as a part of general health assessment is becoming increasingly important. The present study was carried out to assess nutritional status in elderly population aged 60 years or above and to assess the influence of various factors on their nutritional status.

### **Objectives:**

- To assess the nutritional status among elderly population aged ≥60 years in an urban area in Bengaluru.
- 2. To assess the factors influencing the nutritional status among elderly population aged ≥60 years in an urban area in Bengaluru.

#### **METHODS**

#### Study type

A cross sectional study.

## Study population

300 elderly subjects of age  $\geq$  60 years in an urban area, Bengaluru.

## Inclusion criteria

Inclusion criteria were those in the age group of  $\geq$ 60 years, residing in the study area for a minimum of 6 months.

## Exclusion criteria

Exclusion criteria were those who do not consent for study.

## Study period

April - August 2016

## Study sample size

Based on a study done by Yadav et al on elderly nutritional status - 24.97% were malnourished. 10 With

20% allowable error, sample size was calculated as 300 by using the formula.  $n = 4pq d^2$ 

#### Sampling method

Simple random sampling.

## Methodology for data collection

Data collection was done after obtaining clearance from the institutional ethics committee. A house to house survey was done in the urban field practice area of BMCRI Bangalore. All those who were identified to be 60 years and above, where explained about the purpose of the study and where assured that their responses would be kept confidential and among all those who consented to participate, written informed consent was obtained and the data collection was done by interviewing them in their local language using a semi-structured, validated questionnaire, which was taken up at a quiet place.

#### Data collection tools

A proforma was used to collect the baseline information of the subjects, details of factors influencing nutrition in elderly, MNA tool was used to assess nutrition status of elderly and details of awareness, utilization patterns of IGNOAPS where noted.

MNA tool a single and rapid nutrition assessment tool. In the present study all the participants were administered 18 items questionnaire. The scoring system ranged from 0 to 30, categorized subjects as normal/having adequate nutritional status (score  $\geq$ 24 points), border line/at risk of malnutrition (undernutrition, score 17 to 23.5) and malnourished/undernourished (score  $\leq$ 17 points).

Anthropometry assessment was also undertaken as a part of MNA tool using standard procedures which included height, weight, mid upper arm circumference (MUAC) and calf circumference (CC) measurements. Body mass index (BMI) was computed using height and weight data and subjects were classified on the basis of principal cutoff values of WHO.

## Methodology for data analysis

Data was entered in Microsoft excel sheet and SPSS statistical software was used to analyze the data and is presented as descriptive statistics, inferential statistics, tables, figures and graphs.

#### **RESULTS**

A total of 300 participants were included in the study of which majority were females 182 (60.66%) and 118 (39.33%) were males as shown in the Figure 1.

Nutritional status assessment was done by using Mini nutritional assessment (MNA) scale with 18 questions, which included anthropometric assessment, general assessment, dietary assessment and subjective assessment. In the present study out of a total of 300 participants 64(21.33%) were malnourished, 142 (47.33%) were at risk of malnutrition and 94(31.33%) had no malnutrition as depicted in Figure 2.

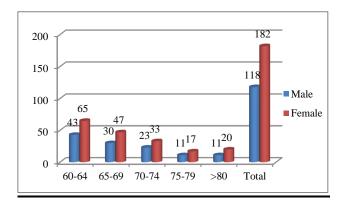


Figure 1: Age and Gender wise distribution of the study participants.

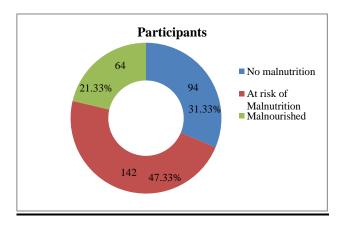


Figure 2: Distribution of nutritional status based on MNA scale.

The percentages calculated in the tables are depicted with respect to the row totals.

The nutritional status of elderly assessed in relation to their age as tabulated in Table 1 depicts that nutritional status declines as the age advances and is statistically significant ( $\chi^2$ =42.12, P value <0.0001).

The assessment of nutritional status of elderly in relation to Gender as shown in Table 2 showed no statistically significant difference ( $\chi^2=3.33$ , P value 0.1892), indicating that both the genders were equally susceptible to malnutrition.

Table 1: Distribution of nutritional status in relation to age.

Age	Distribution of nutritional status		
	No malnutrition	At risk of malnutrition	Malnourished
60-69 (185)	73 (39.45%)	88 (47.56%)	24 (12.97%)
70-79 (84)	15 (17.85%)	47 (55.95%)	22 (26.19%)
≥80 (31)	6 (19.35%)	7 (22.58%)	18 (58.06%)
Total (300)	94	142	64

Chi square value - 42.12; df- 4; P value < 0.0001.

Table 2: Distribution of nutritional status in relation to gender.

Gender	Distribution of nutri	Distribution of nutritional status		
	No malnutrition	At risk of malnutrition	Malnourished	
Male (118)	30 (25.42%)	62 (52.54%)	26 (22.03%)	
<b>Female (182)</b>	64 (35.16%)	80 (43.9%)	38 (20.87%)	
Total (300)	94	142	64	

Chi square value - 3.33; df- 2; P value =0.1892.

Table 3: Distribution of nutritional status in relation to literacy.

Literacy	Distribution of nutrition	Distribution of nutritional status		
	No malnutrition	At risk of malnutrition	Malnourished	
Illiterate (97)	20 (20.61%)	44 (45.36%)	33 (34.02%)	
Literate (203)	74 (36.45%)	98 (48.27%)	31 (15.27%)	
Total (300)	94	142	64	

Chi square value -16.19; df-2; P value =0.0003.

Table 4: Distribution of nutritional status in relation to employment status.

Employment status	Distribution of nutritional status		
	No malnutrition	At risk of malnutrition	Malnourished
Employed in any income generating job (including those Retired & Re- employed) (76)	22 (28.94%)	41 (53.94%)	13 (17.10%)
Retired (62)	17 (27.41%)	27 (43.54%)	18 (29.03%)
Unemployed (including those who were never employed) (162)	55 (33.95%)	74(45.67%)	33 (20.37%)
Total (300)	94	142	64

Chi square value – 4.21; df-4; P value=0.3783.

Table 5: Distribution of nutritional status in relation to living arrangements.

Living Arrangements	Distribution of nutritional status			
	No malnutrition	At risk of malnutrition	Malnourished	
With spouse & children (68)	29 (42.64%)	29 (42.64%)	10 (14.7%)	
With spouse or children (136)	42 (30.88%)	70 (51.47%)	24 (17.64%)	
With other relatives (54)	14 (25.9%)	26 (48.14%)	14 (25.9%)	
Alone (42)	9 (21.42%)	17 (40.47%)	16 (38.09%)	
Total (300)	94	142	64	

Chi square value - 14.17; df- 6; P value=0.0278.

Table 6: Distribution of nutritional status in relation to financial status.

Financial status	Distribution of nutritional status			
	No malnutrition	At risk of malnutrition	Malnourished	
Independent (104)	48(46.15%)	40(38.46%)	16(15.38)	
Dependent (196)	46(23.46%)	102(52.04%)	48(24.48%)	
Total (300)	94	142	64	

Chi square value -16.45; df- 2; P value 0.0003.

On assessing the nutritional status of elderly in relation to literacy as seen in Table 3 showed a statistically significant difference ( $\chi^2=16.19$ , P value 0.0003) indicating that literacy levels influence the nutritional levels of elderly population, among illiterates a higher prevalence (34.02%) of malnutrition was noted in comparison to literates.

In the present study nutritional status assessment of elderly population in relation to employment status is tabulated in Table 4. It is seen that majority of the malnourished were among retired and unemployed but no statistically significant difference ( $\chi^2$ =4.21, P value 0.3783) was observed between the groups.

The assessment of nutritional status of elderly in relation to living arrangements as shown in Table 5 showed a statistically significant difference ( $\chi^2$ = 14.17, P value 0.0278) where lower levels of malnourishment among those elderly living with their spouse &/or children.

On assessing the nutritional status of elderly in relation to financial status as seen in Table 6 Statistically significant difference ( $\chi^2$ =16.45, P value 0.0003) was found for nutritional status with respect to financial status in elderly population.

Among the 300 study participants 216 (72%) where aware of social security scheme (Indira Gandhi National Old Age Pension Scheme). Among the 300 study participants 204 were BPL card holders and of whom only 96 (47%) utilized the scheme.

#### **DISCUSSION**

Aging is an inevitable process, old age cannot be healed. It can only be protected, promoted and extended by adding quality to life. "It is not enough to have added new years to life. Our objective must be to add new life to those years".

In the present study out of a total of 300 participants 64 (21.33%) were malnourished which is similar to the findings of the study done by Neelam Yadav et al on elderly nutritional status where 24.97% were malnourished. The nutritional status declines with the advancing age in the present study these findings are similar to a study done by Shivraj M et. al on elderly nutritional status.

In the present study it is seen that both the genders are equally susceptible to malnutrition, these findings differ from the findings of the study done by Shivraj M et al where the prevalence of malnutrition and risk of malnutrition was more common in female than male, this could be due to difference in study set up including both rural and urban population, whereas, in the present study only urban area was included.<sup>5</sup>

Higher prevalence (34.02%) of malnutrition was noted among illiterates in the present study in comparison to literates indicating that literacy levels influence the nutritional levels of elderly population. This finding is similar to the study done by Shivraj M et al on elderly nutritional status where among illiterate's the prevalence of malnutrition was 26.03 % with  $\chi^2$ =41.92 and P value of 0.001.<sup>5</sup>

In the present study it is seen that employment status did not have much influence on the elderly nutrition but on the other hand financial status of the elderly influenced the nutritional status of elderly population. Lower levels of malnourishment was noted among those elderly living with their spouse &/or children indicating the importance of the family care in preventing the malnutrition.

The factors such as the advancing age, illiteracy, dependent financial status and living arrangements without spouse and/or children worsen the nutritional status among elderly.

Among the study participants 216 (72%) of the elderly were aware of the social security scheme (IGNOAPS) and among the BPL card holders only 96 (47%) utilized these schemes indicating good awareness levels and low utilization levels of the social security scheme. The awareness and utilization patterns of social security scheme among elderly were 74% and 43% respectively in a study done by Srivastava AK et al which is similar to the present study.

#### **CONCLUSION**

Geriatric nutritional assessment should be integrated into a comprehensive geriatric assessment. The social security scheme meant for the elderly, needs to be more effectively implemented at the community level to increase their utilization, which in turn can improve the financial status of elderly and further influencing their nutritional status and health outcomes. Assessment of the nutritional status regularly followed by early interventions will improve the health outcomes, prevents the onset of disability, improves quality of life and saves healthcare costs..

#### Recommendation

- Early corrective interventions for those who are malnourished and at risk of malnutrition includes
  - a) In-depth nutrition assessment with appropriate medical care if necessary.
  - b) Nutrition intervention Oral nutritional supplementation/Diet enhancement by planning of meals by taking into consideration the non communicable diseases and intake of fresh fruits and vegetables.

- c) Close monitoring and nutrition intervention whenever necessary.
- Awareness can be created among those with no malnutrition about the importance of early detection of malnutrition.

## Limitation of study

The biochemical assessment of the parameters for nutritional status was not done. The morbidities which might affect nutritional status were not assessed.

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