

## SHORT ARTICLE

## Nutrition assessment of elderly residing in urban areas and urban slum: A comparative study

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### Abstract

**Background:** In Maharashtra the elderly population is 9.9 % of the total state population (Census 2011). There is a need to highlight the nutritional problems being faced by the elderly in India. Early detection of malnutrition and timely interventions can help to reduce morbidity in the long run. **Aims & Objectives:** To find the prevalence of malnutrition in elderly and compare nutritional status of elderly residing in an urban area and urban slum. **Material & Methods:** This was a cross sectional hospital-based study. Data was collected from the civil OPD and ex-service men OPD of the hospital each having a catchment population from urban slum and urban area respectively. A total of 331 patients > 60 years of age were included. Nutritional status was assessed using the MNA, MUST and GNRI. Serum albumin levels were measured using colorimetric method. **Results:** The overall prevalence of malnutrition and at risk as per MNA score was 168 (50.7%). Out of 331 subjects, 209 belonged to urban slums and remaining 122 were from urban area. The gender and age distribution were comparable in both groups. The mean BMI of subjects from slum area was significantly lower as compared to urban group (22.3+ 5.3 vs 26.3+ 4.5)  $p < 0.001$ . Proportion of elderly who had MNA score below 24 was significantly higher in the slum area ( $p < 0.05$ ). Proportion of elderly with mid arm circumference and calf circumference below the cut off of 22 cm and 31 cm respectively was significantly higher in slum area ( $p < 0.05$ ). Serum albumin levels were comparable in both groups. Mean BMI of elderly in urban area was  $> 25 \text{ Kg/m}^2$ . **Conclusion:** The overall prevalence of malnutrition was high. The nutritional status of elderly in urban slum was significantly worse than that of elderly in urban area

### Keywords

Malnutrition; Elderly; MNA; GNRI; MUST.

### Introduction

Population aging has presently become a universal phenomenon due to falling fertility rates and

increase in life expectancy.(1) It has also been observed that in India the growth in older population has always been more than the growth in general population.(2) In Maharashtra the elderly population

is 9.9 % of the total state population (Census 2011).(3) As people age, they experience many physiological and psychological changes which promote malnutrition. Many lifestyle and social factors like loneliness, poverty, inability to shop or prepare food, isolation, living alone and lack of knowledge about food contribute to malnutrition.

(4)

Malnutrition significantly increases morbidity, mortality and compromises the outcomes of other underlying conditions and diseases. (5) Poor nutrition also predisposes elderly to increased susceptibility to infections for example flu, impede individuals' independence and quality of life, and even increases the risk of death in them. (6) It may also affect outcome of routine illnesses and prolong hospitalization in elderly. (7)

Body mass index (BMI) is not reliable to detect under nutrition especially in elderly. (8) Role of serum albumin alone to detect under nutrition has been a debatable issue. (9) Other methods available to assess nutrition in elderly are Mini Nutritional Assessment (MNA), Malnutrition Universal Screening Tool (MUST), and Geriatric Nutrition Risk Index (GNRI) using serum albumin levels.

There is a need to highlight the nutritional problems being faced by the elderly in India. Early detection of malnutrition and timely interventions can help to reduce morbidity in the long run. Hence, the present study was done

### Aims & Objectives

1. To determine the prevalence of malnutrition (using MNA, MUST and GNRI) in elderly from urban slums and urban area of Pune attending OPD of a tertiary care hospital.
2. To compare nutritional status of study subjects from urban slums and urban area of Pune

### Material & Methods

This was a cross sectional hospital-based study conducted at a tertiary care hospital in western Maharashtra. Data was collected from the civil OPD and ex-service men OPD of the hospital each having a catchment population from urban slums and urban areas respectively. Ethical clearance and informed consent were obtained. Sample size was calculated based on prevalence of malnutrition as 19% with alpha of 0.05 and precision of 5% which comes to 120. However, patients more than 60 years of age (n= 331 patients) attending OPD were included. The study was done over a period of three months Aug

2017-Oct 2017. Geriatric OPD is held twice a week. On each day approximately 100 patients report. Using Systematic sampling patients were selected and interviewed till final sample size was achieved. Approximately (10) patients were assessed on each OPD day. All cases of malnutrition were detected by assessing nutritional status using MNA, GNRI and MUST score. MNA questionnaire comprises of four sections with a total of 18 questions: Anthropometric assessment (weight, height, and weight loss); general assessment (living situation, medicine use, and mobility); dietary assessment (number of meals, food and fluid intake, and autonomy of feeding), and subjective assessment (self-perception of health and nutritional status and nutritional status). The maximum score can be 30. A score below 17 indicates malnutrition, a score of 17-23.5 indicates 'at risk of malnutrition', and a score of 24 or higher indicates a satisfactory nutritional status. GNRI was calculated using the formula  $[1.489 \times \text{albumin (g/L)}] + [41.7 \times (\text{weight/ideal body weight})]$ . (11) Serum albumin levels were measured using colorimetric method. A cut off value of  $\leq 82$  was taken to define malnutrition. Only 171 individuals consented for giving sample for serum albumin levels. MUST score is based on weight loss in last 3 months, BMI and history of acute disease. (12) A score 0 indicates low, 1 medium and 2 or more high risk of malnutrition. Ethical clearance from the institute and informed consent from the patients was taken. Nutrition counseling which covered quality, quantity and frequency of food intake of older persons was given to all participants. Data was analyzed using SPSS 20. Significant difference in means and chi-square test was used.

### Results

Out of 331 subjects 209 were residing in urban slums and remaining 122 were from urban area. The gender distribution of elderly subjects was comparable in both groups (males 119, 56.9% females 90, 43.1) in slum and (males 69,56.6% females 53, 43.4%) in urban area group. The age distribution was also comparable with majority of subjects (80.9% vs 79.5%) in 60-70 yrs, (16.3% vs 16.4%) in 71-80 yrs and (2.9% vs 4.1%) in >81 yrs category. Majority (70%) had at least one non-communicable disease and more than 60% had two or more co-morbidities

The overall prevalence of malnutrition and at risk as per MNA s, MUST score was 168 (50.7%), 38 (11.8%)

respectively. The mean BMI of subjects from slum area was significantly lower as compared to urban group (22.3+5.3 vs 26.3+ 4.5)  $p<0.001$ . Proportion of elderly who had MNA score below 24 was significantly higher in the slum area ( $p<0.05$ ). Proportion of elderly with mid arm circumference and calf circumference below the cutoff of 22 cm and 31 cm respectively was significantly higher in slum area ( $p<0.05$ ). The mean serum albumin levels were 3.9 g/dl. Serum albumin levels were normal ( $>3.5\text{g/dl}$ ) in all the subjects ( $n=171$ ) including those with malnutrition and those at risk of malnutrition. Distribution of patients based on place of residence and nutrition status based on MNA, MUST score and GNRI is given in [Table 1]. The mean GNRI score was significantly lower in urban slum :52+9.8 ( $n=50$ ) and in urban area: 55+7.1( $n=121$ ) ( $p=0.00$ ). Considering MNA as the gold standard the sensitivity and specificity of other two scores was calculated and is given in [Table 2 & Table 3]. The correlation coefficient between mid-arm circumference and BMI ( $r=0.481$ ), Calf circumference and BMI (0.463) was moderate and mid arm circumference and MNA score (0.236) and arm circumference and MNA score (0.232) was weak.

## Discussion

The increasing population of elderly has posed new challenges to the health care system in our country. Malnutrition which has always been viewed as the problem of pediatric age group has now become a cause of concern on the other extreme of age's i.e the elderly. (13) It is not a side effect of ageing but there are many physiological changes like (decreased capacity of taste, smell, poor dental functions, and decrease physical activity contributing to under nutrition. Many researchers (13, 14, 15, 16) have given region specific data on malnutrition in elderly varying between 19-62%. We also found a high prevalence (50%) of under nutrition/ or at risk of under nutrition in elderly. Common non-communicable diseases in our subjects were hypertension, diabetes, coronary artery disease, stroke and malignancy.

Various studies have documented different correlates of under nutrition in elderly on gender differential, deliberated upon smoking, current alcohol consumption, higher medication use, higher co morbidity, and use of walk aid with malnutrition, presence of more than one morbidity etc. (16,17) We in the present study compared nutritional status of

elderly residing in urban areas and urban slums and found that the nutritional state was worse in slums. Elderly too, in slums are exposed to poor living conditions in the form of poor water and sanitation, overcrowding, pollution, open sewerage and contamination translating to high risk of transmission for diseases. They are also exclusively dependent on the market for food and other necessary items and are vulnerable to price increases and other market shocks. Apart from medical reasons intake of food depends upon the purchasing power. Some studies have found that not having an income and not receiving regular financial support were associated with poor nutritional status. Kalaiselvi *et al* documented per capita income less than 1000 INR were found to be significantly associated with under-nutrition. (15,18,19).

With increasing burden of geriatric population in India there is a felt need to provide geriatric health care services at the rural level. This calls for capacity building of all health care functionaries. Our grass root level workers in rural India like Auxillary Nurse Midwife, Anganwadi worker can be trained to use MNA questionnaire and detect those at risk of malnutrition. This can be a no cost, feasible and non-invasive intervention and can serve as screening tool for care of elderly. The same can be done for screening in OPDs by the paramedical staff at the reception.

The nutrition and health of the elderly is often neglected. Most nutritional intervention programs are directed toward infants, young children, adolescents, and pregnant and 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 main strength of our study is use of validated questionnaires. Early detection of elderly at risk of developing malnutrition (MNA score 17 – 23.5) can prevent them from proceeding to protein calorie malnutrition by simple and low cost nutritional interventions. The limitation of the study is that

many of our subjects did not consented for testing of serum albumin levels.

## Conclusion

The overall prevalence of malnutrition was high. The nutritional status of elderly in urban slum was worse than that of elderly in urban area. Mean BMI of elderly in urban area was high.

## Recommendation

Elderly should be screened for their nutritional status in the OPDs irrespective of their presenting complaints

## Limitation of the study

All the subjects in the study did not give consent for testing of serum albumin levels

## Relevance of the study

The age pyramid of the Indian population is gradually changing and population of elderly is increasing. Early detection of malnutrition in them is amenable to low cost interventions and prevents morbidity and mortality in long run

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## Tables

**TABLE 1: DISTRIBUTION OF ELDERLY BASED ON MNA SCORE AND MUST SCORE AND GNRI**

Area of residence	MNA Assessment		p value
	Malnourished/ At risk <23.5	Normal nutrition 24 or above	
Urban slum (n=209)	98	111	0.018
Urban area (n=122)	70	52	
	MUST Assessment		
	Score > 1	Score =0	
Urban slum (n=209)	34	196	0.001
Urban area (n=122)	4	117	
	GNRI Assessment		
	Score <82	Score>82	
Urban slum (n=50)	49	1	NA
Urban area (n=121)	119	2	

\* n=171: number of subjects who consented to give sample for serum albumin levels

**TABLE 2 COMPARISON OF MUST SCORE WITH MNA**

MNA score	MUST score		Total
	Score > 1	Score =0	
Malnourished/ At risk (<23.5)	6	162	168
Normal nutrition (24 or above)	32	131	163
<b>Total</b>	<b>38</b>	<b>293</b>	<b>331</b>
<b>Sensitivity = 15.79% (6.02% to 31.25%); Specificity = 44.71 % (38.93% to 50.60%)</b>			

**TABLE 3 COMPARISON OF GNRI SCORE WITH MNA**

MNA score	GNRI		Total
	≤91.2	>91.3	
Malnourished/ At risk (<23.5)	37	63	100
Normal nutrition (24 or above)	14	57	71
<b>Total*</b>	<b>51</b>	<b>120</b>	<b>171</b>
<b>Sensitivity = 72.55% (58.26% to 84.11%); Specificity = 47.50 % (38.31% to 56.82%)</b>			
<i>*All those who consented for giving sample for serum albumin level</i>			