# A Community-based Cross Sectional Study on Nutritional status among Elderly in Rural Telangana

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# Abstract:

**Introduction:** The world is experiencing increase in geriatric population due to increase in life expectancies at global level. The complex issues leading to nutritional risk and malnutrition are inadequate food intake, social, economic, psychological and pathological factors. **Objective:** To assess the nutrition status of the elderly and to determine the factors associated with it. **Method:** A Cross-sectional study was done in the rural areas of Warangal, Telangana among 280 elderly people ( $\geq 60$  years) using systematic random sampling. A pretested semi-structured questionnaire and the Mini Nutrition Assessment tool were used for data collection. Anthropometric measurements were also estimated. Data entry was done in MS Excel and analysed using SPSS 20.0. Chi-square and Correlation tests were applied. **Results:** Among the 280 elderly, malnutrition was seen in 13.2% of subjects, 51.4% were at risk of malnutrition and 35.4% were adequately nourished. Females, unemployment, smoking habits, presence of comorbidities, inadequate vegetable intake and lack of social support were significantly associated with malnutrition. A strong positive correlation (r= 0.4) was observed between nutrition score and weight, waist circumference, and calf circumference. The difference was statistically significant. **Conclusion:** Most of the elderly (51.4%) were at risk of malnutrition thus emphasizing the need for effective nutritional interventions.

Keywords: Malnutrition, Mini Nutritional Assessment (MNA), Social support

## Introduction:

The world is experiencing an increase in geriatric population exponentially because of improvement in health care which in turn leads to an increase in life expectancies. Globally the geriatric population is expected to reach 1500 million by 2050. This exponential change is predicted to be observed mostly in developing countries.<sup>[1]</sup> According to United Nations Population Division (UNPD) data, the proportion of elderly people in India has doubled to 10.1% in 2020 from 5.4% in 1950.  $^{\scriptscriptstyle [2]}$ 

Malnutrition in elderly is caused by a complex interplay of factors including social, economic, psychological, pathological factors and inadequate food consumption. Geriatric health and nutrition are often ignored. Malnutrition leads to decline in health thus causing increased consumption of healthcare services and mortality.<sup>[3]</sup>

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According to Global Burden of Disease (GBD) 2017, India experienced a mortality of 9,90,9501 deaths with 59% cases among elderly population.<sup>[4]</sup> In India, both communicable and non-communicable diseases have synergistic effect on malnutrition in the elderly. Malnutrition and morbidity form a vicious cycle. COVID-19 has directly and indirectly influenced the nutrition and health of the elderly by affecting the accessibility and affordability to nutritious food and adequate healthcare services. Hence this study was aimed at estimating malnutrition among elderly in rural Telangana and to determine the factors influencing it.

## Method:

A cross-sectional study was conducted in the rural field practice area of a Medical College in Telangana among "elderly" ( $\geq$ 60 years of age) people from February to April 2022. Based on the previous literature,<sup>[5]</sup> the sample size was calculated using the prevalence 20.8%, 5% precision and a non-responsive rate of 5%. The estimated sample size was 276 and was rounded off to 280 samples.

The Rural Health Training Center (RHTC) consist of 5 villages with an estimated population size of 36,530 people. Systematic Random Sampling method was adapted to select the representative sample of 280. At first, list of elderly people details was obtained from the Wardhannapet municipality office. A total of 1321 elderly people were living in the field practice area. Based on the sample size and total number of elderly people, the sampling interval was calculated as k= 5. Using the Epi Info random number generator, the random number was calculated as 3. To begin with the sampling frame, 3<sup>rd</sup> elder was the first selected sample and consequent 5<sup>th</sup> elder was subsequent sample till the selected sample size was attained.

Prior permission from Institutional Ethics Committee was obtained(ECR/840/Inst/ TG/2016/RR/20/51). Subjects who gave consent to participate in the study were included while bedridden and elderly with dementia were excluded. Based on the data obtained from the local municipality office, the houses were visited for the informal interview. After taking Informed consent, the subjects were assessed for malnutrition using Mini Nutrition Assessment Scale (MNA) and anthropometry. The predictor variables such as socio-demographic factors, pension status, and comorbidity status, social and dietary habits were studied using a pre-tested, validated, semistructured questionnaire. Waist, hip and Calf circumference and body mass index (BMI) were measured using standardized techniques with the help of measuring tape and bathroom scale. Height and weight were measured to the nearest 0.1cm and 0.1kg respectively. Calf circumference was measured at the level of the largest circumference of the calf. For waist circumference 90cm was taken as cut off for males and 80cm for females<sup>[6]</sup> and for calf circumference 26.5cm was taken as cut off.<sup>[7]</sup> According to WHO Asian standards BMI less than 18.5  $kg/m^2$  were considered underweight, those within 18.5-22.9 kg/m<sup> $^{2}$ </sup> were normal weight, while BMI within 23.0-24 kg/m<sup>2</sup> were overweight and BMI above 25kg/m<sup>2</sup>were obese.<sup>[8]</sup>

MNA is a non-invasive validated questionnaire containing 18 items under two sections and is recommended as a screening tool to assess the nutritional status of "elderly".<sup>[9]</sup> It broadly assesses the food intake, stress, weight loss, mobility, psychiatric symptoms, BMI, living status, pressure sores, chronic drug intake, subjective assessment of health and nutrition status, mid-arm circumference (MAC) and calf circumference (CC).<sup>[10]</sup> Maximum score of 30 can be attained with score below 17 indicating "malnutrition", 17 to 23.5 indicating "atrisk of malnutrition" and  $\geq$  24 indicating "normal" nutrition status.<sup>[11]</sup>

Data was entered in Microsoft Excel and analysed in SPSS software version 20.0. Descriptive

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and inferential statistics were performed. Chi-square tests and correlation tests were used. P value <0.05 was considered as significant.

## **Results:**

Among 280 subjects, there were 159 (56.8%) males and 121 (43.2%) females. The mean age of the participants was 64.8 yrs. About 259 (92.5%) were staying in their own house while 21 (7.5%) stayed in a rented house. In the present study 217 (77.5%) participants were getting social support from their children, 67.1% were illiterate, 72.9% were employed, 66.7% were married, 10.7% were smokers, 44.6% were alcoholics and 65.7% were receiving pension. (Table 1)

Out of the total participants, only 46 (16.4%) were consuming fruits daily, 264 (94.3%) were consuming vegetables daily and 109 (38.9%) were having co-morbidities.

According to mini nutrition assessment (MNA) the overall prevalence of malnutrition was 37 (13.2%), 99 (35.4%) had a normal nutrition status while 144 (51.4%) were at risk of malnutrition. (Figure-1)

Using only BMI as an indicator of nutrition status, 21.1% were underweight in the present study. Table 2 shows the association of variables with nutrition status of the elderly. Females, elderly who were unemployed, smokers and elderly with comorbidities had higher prevalence of malnutrition. The difference was statistically significant. There was no association between increasing age, getting pension and alcohol consumption with nutrition status.

Figure 2 shows correlation between waist circumference and nutrition score (MNA). As the waist circumference increased, the nutrition score of the elderly also increased. Significant positive correlation (r= 0.4, p<0.05) was observed between nutrition score and weight, waist circumference, calf circumference. Significant positive correlation

able 1: Socio-Demographic characteristics of Study Participants (N=280)				
Variables	n	%		
Gender				
Male	159	56.80%		
Female	121	43.20%		
Age Group (Years)				
60-74	252	90%		
75-84	27	9.60%		
<u>&gt;</u> 85	1	0.40%		
Education				
Literate	92	32.80%		
Illiterate	188	67.20%		
Occupation				
Employed	204	72.90%		
Unemployed	76	27.10%		
Marital Status				
Married	187	66.70%		
Divorced/ widow/ never married	93	33.30%		
Smoking Habits				
Smoker	30	10.70%		
Nonsmoker	250	89.30%		
Drinking Habits				
Alcoholic	125	44.60%		
Nonalcoholic	155	55.40%		
Pension Status				
Receiving pension	184	65.70%		
Not receiving pension	96	34.30%		
Type of Family				
Nuclear	242	86.40%		
Joint	17	6.10%		
3 generation	21	7.50%		

Figure 1: Nutrition status of study participants according to MNA score



Variable	Malnourished	ed At risk of malnutrition n=144	Normal	p value
	n=37		nutrition n=99	
Age				
60-74yrs	32 (12.6%)	130 (51.5%)	90 (35.7%)	
75-84yrs	5 (18.5%)	14 (51.8%)	8(29.6%)	0.572
<u>&gt;</u> 85yrs	0	0	1(100%)	
Gender				
Male	11(6.9%)	84 (48.3%)	64 (40.3%)	0.001
Female	26 (21.5%)	60 (49.6%)	35 (28.9%)	
Education				
Literate	10(10.8%)	39 (42.3%)	43 (46.7%)	0.021
Illiterate	27 (14.3%)	105 (55.8%)	56 (29.7%)	
Occupation				
Employed	21(10.3%)	124 (60.8%)	59 (28.9%)	0
Unemployed	16(21.1%)	20 (26.3%)	40 (52.6%)	
Pension status				
Receiving	27 (14.7%)	90 (48.9%)	67 (36.4%)	0.421
Not Receiving	10(10.4%)	54 (56.2%)	32 (33.3%)	
Smoking habits				
Smoker	15 (50%)	15 (50%)	0	0
Non-Smoker	22 (8.8%)	129 (51.6%)	99 (39.6%)	
Drinking habits				
Alcoholic	16(12.8%)	60 (48%)	49 (39.2%)	0.475
Non-Alcoholic	21 (13.5%)	84 (54.2%)	50 (32.3%)	
Comorbidities	-	-	-	
Present	20 (18.3%)	46 (42.2%)	43 (39.4%)	0.025
Absent	17 (9.9%)	98 (57.3%)	56 (32.7%)	
Social support from children				
Present	27 (12.4%)	102 (47%)	88 (40.6%)	0.003
Absent	10(15.9%)	42 (66.7%)	11(17.5%)	

\* P <0.05 was considered significant. Chi square test was applied.





(r=0.5, p<0.05) was observed between nutrition score and BMI, hip circumference. Significant weak negative correlation (r= -0.14, p<0.05) was seen between nutrition score and age.

#### **Discussion:**

The present study assessed the nutritional status of the elderly of rural Warangal. In the current study 90% of the elderly were in the age group of 60 to 74 yrs. Malnutrition was present in 13.2% of the elderly whereas in studies done by Joymati O et al.<sup>[5]</sup> and Rajan SP et al.<sup>[12]</sup> the prevalence of malnutrition were 20.8% and 21.4% respectively. Compared to

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previous studies the current study had relatively lower prevalence of malnutrition among the elderly. In the current study most of the elderly were "at risk of malnutrition" and this finding was consistent with other studies.<sup>[5,12,13]</sup> Higher prevalence of "at risk of malnutrition" reflects higher proportion of elderly with insufficient protein and energy intake without obvious signs of malnutrition. The above finding in the present study indicates that MNA tool can be used in screening and identifying the people who "at risk for malnutrition" from apparently healthy individuals thus helping to provide necessary interventions at the earliest.

In the current study higher literacy was associated with lower prevalence of malnutrition and these findings were consistent with other studies.<sup>[5]</sup> Elderly who were not receiving social support from their children were having higher prevalence of malnutrition. Lack of Social support form children can lead to loneliness and depression among the elderly, which in turn leads to inadequate food intake and psychological stress-induced malnutrition. Smokers and elderly with comorbidities were having higher prevalence of malnutrition and these findings were similar to a study done by Joymati O et al.<sup>[5]</sup>

Elderly women were significantly more malnourished in this study than men. The finding was consistent with a study done by Lahiri S et al.<sup>[14]</sup> This could be because of some traditional customs where the women eats after the men in the house finish eating. Age was negatively correlated with nutrition score in the current study. Similar observation was seen in a study in rural West Bengal.<sup>[14]</sup> Whereas few studies didnt exhibit an association between nutrition score and age.<sup>[15,16]</sup>

In the current study unemployed elderly were having a higher prevalence of malnutrition. This finding was consistent with previous literature.<sup>[17]</sup> Unemployed individuals are usually financially dependent on others, and this can affect their eating habits due to lack of adequate income.

#### **Conclusion:**

About 13.2% of the geriatric subjects were malnourished in the present study and it was higher among females, elderly living in joint families, unemployed, smokers, elderly without social support, and presence of comorbidities. The difference was statistically significant. Nearly half of them were at risk of malnutrition (51.4%). As malnutrition and morbidity are a vicious cycle, Effective nutritional interventions are needed for the elderly.

### Limitations:

Nutrition status was assessed based on questionnaire method and routine anthropometric measurements. Laboratory investigations were not done to confirm the findings.

#### **Declaration:**

Funding: Nil

Conflicts of interest: Nil

## **References:**

- 1. Agarwalla R, Saikia AM, Baruah R. Assessment of the nutritional status of the elderly and its correlates. J Family Community Med. 2015;22(1):39-43. doi: 10.4103/2230-8229.149588.
- 2. United Nations, Department of Economic and Social Affairs, Population Division. World population prospects 2019. http://population.un.org/wpp/publications/files/wpp2019\_ highlights.pdf. Accessed 18 August 2022.
- 3. Evans C. Malnutrition in the elderly: a multifactorial failure to thrive. Perm J. 2005;9(3):38-41. doi: 10.7812/TPP/05-056.
- Institute for Health Metrics and Evaluation (IHME). https://www.healthdata.org/data-tools-practices/ interactive-visuals/gbd-compare.Accessed 18 August 2022.
- Joymati O, Ningombam M, Rajkumari B, Gangmei A. Assessment of nutritional status among elderly population in a rural area in Manipur: community-based cross sectional study. Int J Community Med Public Health 2018;5:3125-9. doi: 10.18203/2394-6040.ijcmph20182660.
- Han T S, Sattar N, Lean M. Assessment of obesity and its clinical implications BMJ 2006; 333 :695 doi:10.1136/bmj. 333.7570.695
- 7. Selvaraj K, Jayalakshmy R, Yousuf A, Singh AK, Ramaswamy G, Palanivel C. Can mid-upper arm circumference and calf

circumference be the proxy measures to detect undernutrition among elderly? Findings of a community-based survey in rural Puducherry, India. J Family Med Prim Care. 2017 AprJun;6(2): 356-359. doi: 10.4103/jfmpc.jfmpc\_357\_16. PMID: 29302547; PMCID: PMC5749086.

- Shi R, Duan J, Deng Y, Tu Q, Cao Y, Zhang M, Zhu Q, Lu Y. Nutritional status of an elderly population in southwest China: A cross-sectional study based on comprehensive geriatric assessment. J Nutr Health Aging 2015;19(1):26-32.
- Krishnamoorthy Y, Vijayageetha M, Saya GK. Validation and Reliability Assessment of the Mini-Nutritional Assessment-Short Form Questionnaire among Older Adults in South India. Indian J Community Med. 2021;46(1):70-74. doi: 10.4103/ ijcm.IJCM\_208\_20
- Vellas B, Guigoz Y, Garry PJ, Nourhashemi F, Bennahum D, Lauque S, Albarede JL. The Mini Nutritional Assessment (MNA) and its use in grading the nutritional state of elderly patients. Nutrition. 1999;15(2):116-22. doi: 10.1016/s0899-9007(98) 00171-3.
- Guigoz Y. The Mini-Nutritional Assessment (MNA®) Review of the Literature - What does it tell us? J Nutr Health Aging. 2006;10:466-487
- Rajan SP, Jeevithan S, Shanmugapriya D, Padmavathy L. Nutritional status assessment among elderly population in a rural area of South India. Int J Community Med Public Health 2020;7(7):2760-3. doi: 10.18203/2394-6040.ijcmph

20203011

- Govind R, Rajeev J, Bhatt AN. Malnutrition among community dwelling older adults in a rural block area of South India. J Family Med Prim Care. 2020;9(12):5982-5987. doi: 10.4103/ jfmpc.jfmpc\_1248\_20.
- 14. Lahiri S, Biswas A, Santra S, Lahiri SK. Assessment of nutritional status among elderly population in a rural area of West Bengal, India. Int J Med Sci Public Health 2015;4(4). doi: 10.5455/ijmsph.2015.20122014117.
- 15. Soini H, Routasalo P, Lagström H. Characteristics of the Mini-Nutritional Assessment in elderly home-care patients. Eur J Clin Nutr. 2004;58(1):64-70. doi: 10.1038/sj.ejcn.1601748.
- Iizaka S, Tadaka E, Sanada H. Comprehensive assessment of nutritional status and associated factors in the healthy, community-dwelling elderly. Geriatr Gerontol Int. 2008;8(1): 24-31.doi: 10.1111/j.1447-0594.2008.00443.
- 17. Vedantam A, Subramanian V, Rao NV, John KR. Malnutrition in free-living elderly in rural south India: prevalence and risk factors. Public Health Nutr. 2010;13(9):1328-32. doi: 10.1017/ S1368980009991674