

## Original Research Article

# Nutritional status of elderly and its association with frailty among them

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**Received:** 24 November 2021

**Accepted:** 10 December 2021

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### ABSTRACT

**Background:** Malnutrition among geriatrics remain undetected. The present study was conducted to assess the prevalence of malnutrition among geriatric outpatients and various factors associated with it.

**Methods:** This cross-sectional study was done in Mamata medical college, Khammam, Telangana, in which we included geriatric patients (more than 60 years of age) who visited the outpatient clinic between January 2021 till March 2021. All study participants were evaluated for the following two domains of frailty: physical frailty and psychological frailty.

**Results:** During the study period, we included 185 participants in the study. Based on mini nutritional assessment (MNA), 20% participants had normal nutrition, 55% were at risk of malnutrition and 25% had malnutrition. We observed that 59% of the participants with malnutrition were aged more than 80 years, 35% were smokers, 67% were living alone and 83% had comorbidities. It was observed that 67% and 57% of the study participants with malnutrition had impaired activities of daily living and impaired instrumental activities of daily living respectively. 54% of those malnutrition were depressed, which was significantly higher as compared to those with normal nutrition and those at risk of malnutrition (p value <0.05).

**Conclusions:** The results of the present study demonstrate the nutritional status of geriatric outpatients is associated with physical as well as psychological frailty. Therefore, it is recommended that detailed nutritional assessment of patients of geriatric age groups should be conducted when they present in the outpatient clinic for any reason or complaint.

**Keywords:** Malnutrition, Geriatrics, Nutrition, Frailty

### INTRODUCTION

With improving medical care and demographic transition, the Indian population is expected to age in coming decades. With ageing, numerous physiological changes happen in a human body. It includes decreased sense of taste, delayed gastric emptying and various degrees of physical and mental impairment. In addition, a general decrease in nutritional intake can cause protein-energy malnutrition among the elderly. Malnutrition is very common in the older adult population. It was reported to be present in 15%–60% of older adults.<sup>1</sup> Malnutrition and unintentional weight loss contribute to progressive decline in health, reduced physical and cognitive

functional status, increased utilization of healthcare services, premature institutionalization, and increased mortality.<sup>2</sup> Unfortunately nutritional assessment of geriatric population is not a high priority area for many clinicians.<sup>3</sup> As a result, many cases of malnutrition go undetected. The Mini Nutritional Assessment (MNA) is a malnutrition screening tool developed for defining malnutrition or risk of malnutrition. It is widely used in clinical practice and is considered a good standard for malnutrition in older adults. It is hypothesised that poor nutritional status can result in reduced mental and physical functioning, especially in the presence of comorbidities.<sup>4</sup> Thus regular nutritional screening is important in the elderly age group. The present study was

conducted to assess the prevalence of malnutrition among geriatric outpatients and various factors associated with it.

## METHODS

### *Study design and sampling*

This cross-sectional study was done in the outpatient clinic of department of medicine, Mamata medical college, Khammam, Telangana. We included geriatric patients (more than 60 years of age) who visited the outpatient clinic between January 2021 till March 2021. Consecutive outpatients were explained the purpose of the study and a written informed consent was obtained from them. Those consenting to participate were asked about their socio-demographic characteristics and underwent clinical examination. Those refusing to consent were excluded from the final analysis. The study was approved by the Institutional Ethics Committee.

### *Outcome variables*

All study participants were evaluated for the following two domains of frailty.

#### *Physical frailty*

Physical frailty assessed by incontinence (urine and faeces), activities of daily living (ADL) and instrumental activities of daily living (IADL). As described in the study by Kurkcu et al impaired ADL consisted of 'partially' and 'fully dependent', while impaired IADL consisted of 'fully dependent'.<sup>5</sup>

#### *Psychological frailty*

Psychological frailty was assessed by impaired cognition, based on mini-mental status examination (MMSE) and depression, based on geriatric depression scale (GDS).<sup>6</sup> Impaired cognition was observed in those with MMSE score of 24 or less and depression in those with GDS score of 6 or more.

### *Data collection and data analysis*

A pre-designed semi-structured questionnaire was used to collect various participant relation information. Socio-demographic variables like age, gender, education and marital status were noted for all study participants. Personal history regarding current smoking and alcohol consumption were asked from all participants. Presence of any comorbidity was noted as well. Nutritional status of all study participants was assessed using MNA. Those with a score higher than 23.5 were considered to have an adequate nutritional status, those with a score between 17 and 23.5 were at risk for malnutrition and those with a score lower than 17 were considered malnourished.

Based on MNA, all study participants were divided in to three groups: normal nutrition, at risk of malnutrition and malnourished. All the variables were described as frequency distribution and comparison between different groups based on MNA were compared using chi-square test. The analysis was performed in SPSS (IBM, version 23). A p value of less than 0.05 was considered as statistically significant.

## RESULTS

During the study period, we included 185 participants in the study. Based on MNA, it was observed that 37 (20%) participants had normal nutrition, 102 (55%) were at risk of malnutrition and the rest 46 (25%) had malnutrition. Table 1 describes the baseline characteristics of the study participants and their comparisons. We observed that 59% of the participants with malnutrition were aged more than 80 years, which was significantly higher as compared to those with normal nutrition or were at risk of malnutrition (p value <0.01). The distribution of study participants according to their gender and education status was similar across the three groups. Furthermore, we observed that 35% of the participants with malnutrition were currently smokers, which was significantly higher as compared to those with normal nutrition (14%) or were at risk of malnutrition (11%) (p value <0.05). Similarly, the current alcohol consumption was more common among those with malnutrition (57%) as compared to those with normal nutrition (19%) or were at risk of malnutrition (24%) (p value <0.01). There were significantly higher proportion of single/widow(er)/divorced in the malnourished group (67%) as compared to those with normal nutrition (35%) or at risk of malnutrition (25%), p value <0.05. Lastly, 83% of the participants with malnutrition had comorbidities, which was significantly higher as compared to those with normal nutrition (46%) and at risk of malnutrition (36%), p value <0.01.

Table 2 compares various measures of frailty between participants with normal nutrition, those at risk of malnutrition or those with malnutrition. Among physical frailty, incontinence, impaired ADL and impaired IADL were compared between the groups. It was observed that incidence of incontinence was similar between the three groups (p=0.52). Impaired ADL and impaired IADL were significantly more common among those with malnutrition. It was observed that 67% and 57% of the study participants with malnutrition had impaired ADL and impaired IADL respectively. Among psychological frailty, impaired cognition was similar between the groups. However, 54% of those malnutrition were depressed, which was significantly higher as compared to those with normal nutrition and those at risk of malnutrition (p value <0.05).

**Table 1: Baseline characteristics of the study participants.**

Variables	Normal nutrition (MNA >23.5)		At risk of malnutrition (MNA 17 to 23.5)		Malnutrition (MNA <17)		P value*
	N	%	N	%	N	%	
Age group (years)							
60 to 70	18	49	38	37	9	20	<0.01
71 to 80	15	41	45	44	10	22	
More than 80	4	11	19	19	27	59	
Gender							
Female	18	49	52	51	22	48	0.88
Male	19	51	50	49	24	52	
Education							
Uneducated	10	27	27	26	21	46	0.07
Till middle	11	30	35	34	14	30	
Higher or above	16	43	40	39	11	24	
Current smoker	5	14	11	11	16	35	<0.05
Current alcohol use	7	19	24	24	26	57	<0.01
Marital status							
Married	24	65	77	75	15	33	<0.05
Single/widow(er)/divorced	13	35	25	25	31	67	
Comorbidity present	17	46	37	36	38	83	<0.01
Total	37	100	102	100	46	100	

\*Analysed using Chi-square.

**Table 2: Comparison of frailty domains according to nutritional status.**

Frailty	Normal nutrition (MNA >23.5)		At risk of malnutrition (MNA 17 to 23.5)		Malnutrition (MNA <17)		P value*
	N	%	N	%	N	%	
Physical frailty							
Incontinence	17	46	53	52	22	48	0.52
Impaired ADL	11	30	32	31	31	67	<0.05
Impaired IADL	6	16	33	32	26	57	<0.05
Psychological frailty							
Impaired cognition	14	38	40	39	21	46	0.06
Depressed	6	16	37	36	25	54	<0.05
Total	37	100	102	100	46	100	

\*Analysed using Chi-square.

## DISCUSSION

Overall, we observed that 37 (20%) participants had normal nutrition, 102 (55%) were at risk of malnutrition and the rest 46 (25%) had malnutrition. In a similar study, Kurkcu et al reported that 116 (29%) were adequately nourished, 226 (56%) were at risk of malnutrition and 62 (15%) were malnourished. Kansal et al reported in a sample of 190 geriatrics that 33% had normal nutrition, 43% were at risk of malnutrition and 24% were malnourished.<sup>7</sup> Kavya et al enrolled 91 elderly in a community based study and observed that 51 (56%) out of 91 were at risk of malnutrition and 28 (30.8%) were found to be malnourished, while 12 (13.2%) had normal nutrition.<sup>8</sup> Nazan et al investigated 102 patients aged 65 years and above who were visiting an outpatient clinic in a hospital. Of these, the authors found that 43% had normal nutrition, 18% were at risk of malnutrition and

39% had malnutrition.<sup>9</sup> In a similar study, Patil et al observed that 128 (23.5%) participants were malnourished, 267 (49%) were at risk of malnutrition and 150 (27.5%) had normal nutritional status.<sup>10</sup>

The present study was conducted to assess the nutritional status of geriatric outpatients and various socio-demographic variables associated with malnutrition. It was observed that 59% of those with malnutrition were aged more than 80 years, which was significantly more common than in those with normal nutrition or those at risk of malnutrition. Similar observation was made by Kurkcu and colleagues, who found that malnourished patients were older.<sup>5</sup> In their study, mean age of malnourished patients was 82.2 years, which was significantly higher than those with normal nutrition, 79.1 years (p value < 0.01). Kansal and colleagues also observed no association between gender and nutritional status.<sup>7</sup> In the study by Kavya et al, majority of the study

participants 80 years and above were malnourished and thus observed a statistically significant association was found between age and nutritional status of the participants ( $p = 0.007$ ).<sup>8</sup> Nazan et al reported significant association of nutrition status with low education level alone, and not with age or gender.<sup>9</sup> Patil et al found a significant association of nutritional status with age of the patients.<sup>10</sup> The authors observed that among the participants aged  $\geq 80$  years, majority were malnourished.

From our study, it appears that marital status in the geriatric population also has a bearing on their nutritional status. Kurkcu et al also found that malnourished patients were more likely to be single, as compared to those with normal nutrition.<sup>5</sup> Nazan and colleagues also observed that 81% of malnourished elderly were single and the association was statistically significant. **Error! Bookmark not defined.** Current smoking and alcohol consumption was also found to be significantly associated with malnutrition among the geriatric outpatients investigated in this study. Likewise, presence of comorbidities were also found to be associated with malnutrition. In the study by Kurkcu et al, of the malnourished patients, 21% were current smokers, 31.7% consumed alcohol and had a median of 4 comorbidities.<sup>5</sup> They concluded that malnourished patients were more likely to smoke, less likely to drink alcohol and had more comorbidities

Among physical frailty assessments, ADL and IADL were found to be impaired more commonly in those with malnutrition. In the study by Kurkcu et al impaired ADL and IADL were found in 62.9% and 54.8% of those who were malnourished.<sup>5</sup> These were significantly more common in malnourished as compared to those with normal nutrition. Among psychological frailty assessment, malnourished participants were found to be depressed more commonly. In a similar study by Kurkcu et al, impaired cognition was observed in 64.5% of the malnourished patients, which was not significantly different from other two groups.<sup>5</sup> While depression was observed in 46.8% of the malnourished patients, which was significantly higher than those with normal nutrition.

There are a few limitations of the study. We did not assess plasma concentration of vitamin B12, folic acid and vitamin D to supplement the clinical nutritional assessment. We could collect information on only a handful of confounder variables like gender, marital status and personal history. It is possible that many other confounders were missed, which could explain the results of the study. Third, study participants were recruited from an outpatient clinic. It is possible that the results would be different if a community based sample is studied.

## CONCLUSION

The results of the present study demonstrate the nutritional status of geriatric outpatients is associated with

physical as well as psychological frailty. Therefore, it is recommended that detailed nutritional assessment of patients of geriatric age groups should be conducted when they present in the outpatient clinic for any reason or complaint. Large sample studies are required to support the results of the present study. Also future studies need to include specific micronutrient assessment, so that their role in frailty could be assessed.

*Funding: No funding sources*

*Conflict of interest: None declared*

*Ethical approval: The study was approved by the Institutional Ethics Committee*

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**Cite this article as:** Deshpande AV, Ravikumar BP. Nutritional status of elderly and its association with frailty among them. *Int J Community Med Public Health* 2022;9:153-6.