

Original article:

Health Status of Elderly, with Special Reference to Nutritional Status: A Cross Sectional Study

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Abstract:

Introduction: India confronts health and malnutrition challenge for its 8.6% of its elderly population. Malnutrition is complex condition influenced by multiple factors such as sociodemographic, somatic, dietary and lifestyle characteristics.

Objectives: To study the health status, sociodemographic factors, nutritional status using MNA scale and associated risk-factors among elderly attending RHTC OPD affiliated to tertiary health care centre of central India.

Methods: A cross-sectional study was conducted during December 2022 to September 2023 among 300 elderly of ≥ 60 years of age. A structured questionnaire was used to record the sociodemographic and relevant personal details. MNA scale was used to assess malnutrition. Data was entered in MS Excel window version 11 and analysed by using Open-Epi Software. Association between two categorical variables was analysed by using Chi-square test.

Results: MNA Scale showed 22.67% were malnourished and 39.00% were At-Risk of malnutrition. Among 300 elderly, 53% were from 60- 70 years of age group and 52% were females. Being older of age ≥ 70 years (OR= 3.92), Female (OR= 2.04), widow/ widower (OR= 3.21), Illiterate (OR=5.88), living Alone (OR= 3.21) within broken family (OR= 3.21) were significantly associated with malnutrition ($p < 0.05$).

Lower socioeconomic status (OR= 2.73), financial dependency (OR= 4.23) and presence of Morbidity (OR= 2.35) were also associated with malnutrition ($p < 0.05$).

Conclusion: The nutritional status of the elderly was found to be significantly poor in this study. Lack of awareness regarding nutritional status necessitates the implementation of screening, early diagnosis and treatment at primary health care level to promote healthy aging.

Key words: Elderly, Health-status, Nutritional-status, MNA scale, Risk-factors.

Introduction:

Aging is an inevitable phenomenon. India, as the first most populous country has 104 million people at or over the age of sixty (2011 Census) constituting about 8.6% of its total population. According to the Report of the Technical Group on Population Projections for India and States 2011-2036, there are nearly 138 million elderly persons in India in 2021 (67 million males and 71 million females) and is further expected to increase by around 56 million elderly persons in 2031. The proportion has increased to 10.1% in 2021 and further likely to increase to 13.1% in 2031. For males it was marginally lower at 8.2%, while for females it was 9.0%.

The World Health Organization (WHO) has stated that Health of the elderly will be an important issue defining the health status of a population. Old age and nutrition have now become a global challenge. In India, more than a quarter of elderly aged 60 and above are underweight (27%) and a fifth of elderly are overweight/obese (22%), indicating a dual burden of undernutrition and overnutrition among elderly in India. (Nutritional status of senior citizens: PIB Delhi, 2022)

Multimorbidity associated with increasing age is common and is found to be more frequent in resource-poor countries. So, it becomes necessary to assess the nutritional status among elderly as early detection and effective preventive, promotive and curative measures can provide better quality of life. Considering these facts, this study is proposed to conduct to assess the nutritional status of elderly.

Aim and Objectives:

1. To study the health status among elderly attending RHTC OPD in central India.
2. To assess the nutritional status and associated risk factors of study participants using MNA (Mini Nutritional Assessment) scale.
3. To study sociodemographic factors of study participants.

Materials and methods:

- Study design: A cross sectional study
- Study setting: RHTC OPD affiliated to tertiary health care centre of central India.
- Study population: Elderly persons (≥ 60 years of age) attending RHTC OPD affiliated to tertiary health care centre of central India.

1. Inclusion criteria:

Elderly persons of ≥ 60 years of age.

2. Exclusion criteria:

1. Persons < 60 years of age.
2. Persons who are critically ill or had terminal illness or with severe cognitive impairment or not able to answer the questions.
3. Those who are not willing to participate.

Study period was extended from December 2022 to October 2023.

Sample size & Sampling technique:

Sample size was estimated using following formula,

Taking p = prevalence of possible malnutrition
from the study conducted by

Patil D, Shindhe M. Nutritional status assessment of elderly using MNA tool in rural Belagavi: a cross sectional study. International Journal of Community Medicine and Public Health. 2018; 5: 4799-803

Prevalence of possible malnutrition $p = 73.5\%$

$$q = 100 - p = 26.5\%$$

Level of significance: 95% ($z = 1.96$)

Error (e): 5% absolute error

Sample size formula $n = z^2 \times pq / e^2$

The sample size came to be 300

Informed consent from study participants was taken after establishing rapport and explaining the purpose of study.

Methodology:

Elderly persons of ≥ 60 years of age were enrolled in the study. A face-to-face interview was taken and Proforma was used for collection of information regarding sociodemographic characteristics and relevant personal details of the elderly.

To assess nutritional status, the Mini Nutritional Assessment (MNA) questionnaire was used. It is a validated screening tool to provide a single, rapid assessment of nutritional status among the elderly with a sensitivity of 96%, a specificity of 98%, and a predictive value of 97%. It has been validated and translated into several languages in many countries including India. The full MNA includes 18 items, with 15 verbal questions and 3 based on anthropometric measurements. The response of each item has a numerical value and contributes to the final score, which has a maximum value of 30.

For the current study, nutritional status was classified as normal nutrition (24–30 points), At- risk of malnutrition (17–23.5 points) and malnourished (<17 points in MNA).

Socioeconomic status (SES) of the respondents was assessed by Modified BG Prasad Scale (March 2023). Investigation records were reviewed & mentioned in the data sheet. Anthropometric measurements, General & Systemic examination were done.

Operational definitions:

A person was considered financially independent if he/she was either earning or were receiving pension & a person was considered financially dependent if he/she was totally dependent on other family members.

Current alcohol/ tobacco users were someone who at the time of survey uses alcohol/ tobacco in any form either daily or occasionally. Past alcohol/ tobacco users were those individuals who were used alcohol/ tobacco in the past but did not used ever in one year preceding the survey. Non- alcohol/ tobacco users were those who had never used alcohol/tobacco in lifetime.

Data was entered in MS Excel window version 11 and analysed by using Open-Epi Software.

Descriptive statistics quantitative variables were measured as Mean, Standard Deviation, Range while qualitative variables were presented as Number and Percentage. Bar chart and Pai charts were used to summarise baseline characteristics of the study participants.

Association between two categorical variables was analysed by using Chi-square (χ^2) test; p value < 0.05 was considered to be statistically significant, Odds Ratio was calculated.

Results:

Variables		Number	Percentage
1. Age (in years)	60- 65	103	34.33
	65- 70	56	18.67
	70- 75	84	28.00
	75- 80	40	13.33
	> 80	17	05.67
Total		300	100.00
2. Gender	Male	144	48.00
	Female	156	52.00
Total		300	100.00
3. Residence	Rural	219	73.00
	Urban	81	27.00
Total		300	100.00
4. Religion	Hindu	189	63.00
	Muslim	13	4.33
	Bauddha	94	31.34
	Sikh	4	01.33
Total		300	100.00
5. Marital Status	Married	187	62.33
	Widow/Widower	113	37.67
Total		300	100.00
6. Type of family	Nuclear	107	35.67
	Joint	39	13.00
	Three Generation	115	38.33
	Broken	39	13.00
Total		300	100.00
7. Education	Illiterate	148	49.33
	Primary	46	15.33
	Middle	20	06.67
	High	38	12.67

	Intermediate	28	09.33
	Graduate	20	06.67
	Total	300	100.00
8.Occupation	Unemployed	129	43.00
	Semi-skilled	15	05.00
	Unskilled	08	02.67
	Skilled	53	17.67
	Retired	69	23.00
	Homemaker	26	08.66
	Total	300	100.00
9.Socioeconomic Status (Modified BG Prasad scale)	Class I	13	04.33
	Class II	95	31.67
	Class III	93	31.00
	Class IV	65	21.67
	Class V	34	11.33
	Total	300	100.00
10. Financial Dependency	Dependent	161	53.67
	Independent	139	46.33
	Total	300	100.00
11. Living Status	With Family	228	76.00
	With Spouse	33	11.00
	Alone	39	13.00
	Total	300	100.00
12. Type of Diet	Vegetarian	159	53.00
	Mixed	141	47.00
	Total	300	100.00

Total 300 participants were enrolled in the study among which 156 (52.00%) were female & 144 (48.00%) were male. Majority were in the age group of 60-65 years 103 (34.33%) followed by 70-75 years 84 (28.00%). The Mean age is 67.96 years & SD is ± 6.04 with minimum age is 60 years & maximum is 85 years (Range 25).

Majority 219 (73.00%) from Rural area, 39 (13.00%) lived in Broken family, 189 (63.00%) were Hindu, 187 (62.33%) were married and 148 (49.33%) were illiterate.

Majority 129 (43.00%) were unemployed and 69 (23.00%) retired. As per the Modified BG Prasad scale (March 2023), 93 (31.00%) were from class III followed by 65(21.67%), 34(11.33%), belong to Class IV, Class V respectively.

228 (76.00%) elderly lived with their family while 39 (13.00%) lived alone and 33 (11.00%) lived with spouse only.161 (53.67%) were financially dependent on their family members while 139 (46.33%) were financially independent. [Table 1]

Variables		No.	Percentage
1. Morbidities (n= 300)	Present	241	80.33
	Absent	59	19.67
Total		300	100.00
2. Number of morbidities (n=241)	1	130	53.94
	>1	111	46.06
Total		241	100.00
3. Medication use (n= 241)	≤3	196	81.33
	>3	45	18.67
Total		241	100.00
4. Use of Walking Aid (n= 300)	Yes	81	27.00
	No	219	73.00
Total		300	100.00
1. Tobacco use	Current	117	39.00
	Never	138	46.00
	Past	45	15.00
Total		300	100.00
2. Alcohol use	Current	59	19.67
	Never	205	68.33
	Past	36	12.00
Total		300	100.00

Among 300 elderly, 241(80.33%) had one or more morbidities, majority 196(81.33%) were taking ≤3 medications while 81(27.00%) were using walking aid. One hundred seventeen (39.00%) and 59(19.67%) were current tobacco users & current alcohol users respectively. [Table 2]

1. Nutritional status (MNA score)	Malnourished (<17)	68	22.67
	At risk of malnutrition (17- 23.5)	117	39.00
	Normal nutritional status (24- 30)	115	38.33
Total		300	100.00
2. BMI	Normal	152	50.67
	Underweight	83	27.67
	Overweight	11	03.66
	Obese	54	18.00
Total		300	100.00

Prevalence of malnutrition was found to be 68(22.67%) while 117(39.00%) were-At risk of malnutrition, 83(27.67%) were underweight & 54(18.00%) were obese. [Table 3]

Table 4. Association between Sociodemographic characteristics, risk factors with Malnutrition among study participants (n= 300)

Variables	Malnutrition		OR	95% CI	p value
	Present	Absent			
Age (in years)					
≥70 (141)	49	92	3.92	2.172, 7.09	0.0000
<70 (159)	19	140			
Gender					
Female (156)	50	106	2.04	1.195, 3.496	0.0123
Male (144)	27	117			
Religion					
Others (111)	32	79	1.46	0.8547, 2.501	0.2112
Hindu (189)	41	148			
Marital Status					
Widow/ Widower (113)	43	70	3.21	1.865, 5.543	0.0000
Married (187)	30	157			
Residence					
Rural (219)	56	163	1.29	0.6993, 2.392	0.5030
Urban (81)	17	64			

Education					
Illiterate (148)	58	90	5.89	3.145,	0.0000
Others (152)	15	137		11.02	
Socioeconomic class					
III, IV, V (192)	56	136	2.20	1.205,	0.0138
I, II (108)	17	91		4.303	
Type of family					
Broken (39)	18	21	3.21	1.6,	0.0013
Others (261)	55	206		6.441	
Living Status					
Alone (39)	18	21	3.21	1.6,	0.0013
With family/ with spouse (261)	55	206		6.44	
Occupation					
*Not Working (155)	56	99	4.26	2.331, 7.7821	0.0000
Working (145)	17	128			
Financial Dependency					
Dependent (161)	57	104	4.23	2.283,	0.0000
Independent (139)	16	123		7.777	
Diet					
Vegetarian (159)	39	120	1.02	0.6029, 1.735	0.9591
Mixed (141)	34	107			
Comorbidity					
Present (241)	65	176	2.35	1.06,	0.0474
Absent (59)	8	51		5.228	

*Not Working includes Retired, Housewife and Unemployed

Elderly, who were ≥ 70 years was 3.92 times more prone for malnutrition as compare to those who were < 70 years of age (95% confidence interval [CI]: 2.17-7.09, $p = 0.0000$).

Female (OR= 2.04), Widow/ Widower (OR= 3.21), illiterate (OR= 5.89), those from lower socioeconomic class III, IV, V (OR= 2.20), living alone within Broken family (OR= 3.21) had more chances of being malnourished as compared others. ($p < 0.05$)

Elderly who were not working (OR= 4.25), financially dependent on other family members (OR= 4.23) were also prone for being malnourished. Risk factors like underweight (OR= 7.31) & presence of morbidities (OR= 2.35) were also significantly associated with malnutrition ($p < 0.05$).

Discussion

The prevalence of malnutrition among the elderly in the world ranges from 0% to 65% using MNA scale. [9,10,31, 32]. The variability of the prevalence of the malnutrition in the elderly can be due to cross cultural differences and study setting. In this study, 22.67% elderly were found to be malnourished & 39.00% were At Risk of Malnutrition according to the MNA score. The results were almost similar to the study conducted by

Patil DJ et al in rural Belagavi, Karnataka [8], it was observed that 23.50% of elderly were malnourished & 49.00% were At Risk of Malnutrition. This could be because of both the studies were conducted in rural areas.

In our study, majority of the elderly were in the age group of 60- 65 years with the mean age 67.96 ± 6.04 years. The finding observed in our study was similar to the study conducted by Patil DJ et al., Kansal et al, Kavya et al & Vedantham et al [8,21,22,16].

In this study, 52% of the participants were females with female to male ratio 1.08:1, significant association was found between gender & MNA score. Studies conducted by Patil DJ et al., Kansal et al, Kavya et al [8,21,22] were also shows similar findings. In contrast, studies conducted by Lahiri et al, Kritika et al and Reddy et al had shown that male participants were more than the females. [14,33,34].

Study shows, 53.67% participants were financially dependent to other family member & they were 4.23 times more prone to malnutrition. Study conducted by Vaish K et al observed 77.00% elderly were financially dependent to other family member & they were more prone to malnutrition. In our study, 37.67% participants were widow/ widower & they had 3.21 times higher risk of malnutrition. Studies conducted by Vaish K et al observed 32.29% participants were widow/ widower/ divorced & they had 2.57 times higher risk of malnutrition.

Conclusion:

The nutritional status of the elderly population has been found to be significantly poor, as evidenced by the results of this study. The findings of this research demonstrate that malnutrition is a complex condition that is influenced by a range of factors, including sociodemographic, somatic, dietary, and lifestyle characteristics. Furthermore, the study highlights a lack of awareness regarding the importance of nutritional screening, early diagnosis, and treatment services at the primary level, which could lead to effective interventions aimed at promoting healthy aging. Therefore, there is a clear need and opportunity for elderly nutritional interventions to be implemented.

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