

A Community Based Cross-Sectional Study on Morbidity Profile and Nutritional Status of Elderly in a Rural Taluk of Karnataka

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Abstract

Background: Population ageing is increasing rapidly worldwide and has become an important public health concern. Elderly individuals are more vulnerable to multiple chronic morbidities and nutritional deficiencies, particularly in rural settings where access to healthcare and adequate nutrition may be limited. The present study was conducted to assess the morbidity pattern and nutritional status among elderly individuals residing in a rural taluk of Karnataka. **Materials And Methods:** A community-based cross-sectional study was conducted among elderly individuals aged 60 years and above residing in Sullia taluk of Karnataka. A total of 280 participants were included in the study. Data regarding sociodemographic characteristics, health habits, and morbidities were collected using a predesigned semi-structured questionnaire. Nutritional status was assessed using the Mini Nutritional Assessment (MNA) tool. Statistical analysis was performed using SPSS version 21, and associations between variables were tested using the chi-square test. **Results:** Among the 280 participants, the majority belonged to the 60–69 years age group (52.85%), and females constituted 52.14% of the study population. Musculoskeletal disorders (49.29%) were the most common morbidity followed by hypertension (36.43%) and eye disorders (34.29%). Based on the MNA, 55% of participants had normal nutritional status, while 32.9% were at risk of malnutrition and 12.1% were malnourished. Malnutrition was significantly associated with education, marital status, financial dependency, smoking, alcohol use, presence of multiple comorbidities, and polypharmacy ($p < 0.05$). **Conclusion:** A considerable proportion of elderly individuals were either malnourished or at risk of malnutrition. Early identification of vulnerable elderly individuals and implementation of appropriate nutritional and healthcare interventions are essential to improve their health and quality of life.

Keywords: Elderly; Nutritional Status; Morbidity Pattern; Rural Population.



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INTRODUCTION

The proportion of elderly individuals in the population is increasing worldwide, making population ageing an important demographic trend, especially in developing countries like India. Globally, the life expectancy at birth had reached 73.3 years in 2024 and the proportion of elderly aged 60 and above, is projected to increase from 1.1 in 2023 to 1.4 billion by 2030.[1] In India, the elderly population constitutes 8.1% of the total population.[2] This steady rise in elderly population has been attributed to advances in social and economic development, improvements in health care and better control of infectious diseases.[1]

Ageing is associated with physiological, psychological and social changes that increase vulnerability to various health problems.[3,4] The elderly population are susceptible to many chronic diseases like hypertension, diabetes mellitus, stroke, musculoskeletal disorders, visual impairment and respiratory illnesses.[5-7] These morbidities are known to significantly influence their functional ability, quality of life and independence.[8] This disease burden in the elderly is often compounded by limited access to health care services, poverty, social isolation, and inadequate care giving especially in rural areas where health care infrastructure may be limited.[9-11]

Another critical determinant of health in the elderly population is their nutritional status.[12,13] Reduced appetite, impaired digestion, chronic illnesses, medication use and socioeconomic constraints can adversely affect dietary intake and nutritional status.[14-17] Because of malnutrition, these elderly may become susceptible to infections, delayed recovery from illnesses, functional decline and higher mortality.[18] Studies conducted in different parts of India have reported the prevalence of malnutrition among the elderly to vary between 7 and 19% when assessed using MNA tool.[2] A metanalysis

of studies in India report that the prevalence of malnutrition among the elderly was 18.29% and almost 48.17% were at the risk of malnutrition.[19] Similarly, a community based cross sectional study conducted in Puducherry estimated the prevalence of malnutrition among the elderly to be 17.9% and another 58.8% were estimated to be at risk of malnutrition.[20]

The coexistence of morbidity and malnutrition among the elderly is a significant public health problem as they form a vicious cycle. Chronic diseases can worsen the nutritional status by increasing the metabolic demands and decreasing the dietary intake, while malnutrition itself can worsen the already existing longstanding illness and increase the vulnerability to new health conditions.[21]

In rural areas, these problems are aggravated by various factors like poor socio economic status, poor health seeking behavior, limited awareness about nutrition and inadequate access to healthcare services. These elderly population in rural areas are also vulnerable because they may face additional challenges like dependence on family members, social neglect and food insecurity.

Understanding the morbidity profile and nutritional status of the elderly population is essential for planning appropriate health interventions and policies aimed at improving their quality of life. Thus the present study aims to assess the morbidity pattern and nutritional status of the elderly population residing in rural areas of Sullia taluk, Karnataka, which will help generate evidence for strengthening geriatric health care services and nutritional interventions at community level.

MATERIALS AND METHODS

The present study was conducted as a community based cross sectional study in Sullia, a rural taluk in Dakshina Kannada district of Karnataka over a period of 18 months from October 2023 to April 2025. The study population comprised elderly individuals aged 60 years and above residing in the study area.

The sample size was calculated based on the results of a pilot study conducted among elderly individuals in the study area to estimate the proportion of morbidity among people aged 60 years and above. The prevalence of morbidity was found to be 77%, which was taken as the value of p for sample size calculation. Using the formula $n = Z^2 p(1-p)/d^2$, where $Z = 1.96$ at 95% confidence level and the allowable error (d) was 5%, the minimum sample size was calculated to be 272. This value was rounded off to 280 participants.

A cluster sampling method was used to select the study participants. Sullia taluk consists of 40 villages, and seven elderly individuals from each village were selected to achieve the required sample size of 280 participants. In each village, the Village Panchayat was considered as the central point for data collection. From this point, houses along the road to the right were approached to identify eligible elderly individuals and collect data. In situations where fewer houses or eligible participants were available on the right side, the investigator proceeded to the left side. If there were still insufficient houses with elderly individuals or if a dead end was encountered, the investigator continued forward and then approached houses in the opposite direction. Only one elderly individual aged 60 years or above from each household was randomly selected for participation in the study.

The inclusion criteria for the study included all individuals aged 60 years and above residing in the study area, with the condition that only one elderly individual per household would be randomly selected. The exclusion criteria included individuals who had lived in the study area for less than five years, houses that remained locked during three visit attempts, and elderly individuals who displayed hostile behaviour or declined to sign the informed consent form.

Data were collected using a predesigned semi-structured proforma, which was validated by at least three experts prior to data collection. The questionnaire included information on sociodemographic characteristics, existing morbidities, and dietary practices of the participants. Nutritional status of the elderly was assessed using the Mini Nutritional Assessment (MNA) tool. Morbidities were assessed based on self reported history and available medical records.

Prior to data collection, the selected participants were informed about the purpose and importance of the study, and written informed consent was obtained. The participants were seated in a comfortable and private environment to ensure confidentiality and to allow them to respond freely without external influence. A brief preliminary conversation was initiated to establish rapport, following which the interview was conducted using the predesigned proforma to obtain the required information.

Prior to commencement of the study, approval was obtained from the Institutional Ethics Committee. All participants were informed about the study, and written informed consent was obtained before their inclusion in the study.

The collected data were entered into Microsoft Office Excel 2007, and statistical analysis was performed using IBM SPSS version 21. Categorical variables were analysed using the Chi-square test, while continuous variables, if any, were analysed using the Student's t-test. A p-value of less than 0.05 was considered statistically significant.

RESULTS

A total of 280 elderly individuals aged ≥ 60 years participated in the study. The sociodemographic characteristics of the study population are shown in Table 1. The majority of participants belonged to the 60–69 years age group (52.85%), and females (52.14%) slightly outnumbered males (47.85%). Most participants were married (62.85%), while 34.28% were widowed. Nearly 44.64% had primary level education, and 42.85% were unemployed or homemakers. According to the Modified B.G. Prasad classification, the largest proportion of participants belonged to the middle socioeconomic class (33.57%). About 37.14% were fully financially dependent, while 29.28% were financially independent.

The health characteristics of the participants are summarized in Table 2. A majority were non-smokers (70%) and non-drinkers (74.29%). Nearly 43.57% of participants had two or more comorbidities, and 31.43% were taking three or more medications per day.

The morbidity profile of the study population is presented in Table 3. Musculoskeletal disorders (49.29%) were the most commonly reported morbidity, followed by hypertension (36.43%) and eye disorders (34.29%). Other commonly reported conditions included diabetes mellitus (24.29%) and respiratory diseases (20.71%).

The nutritional status assessed using the Mini Nutritional Assessment (Table 4) showed that 55% of participants had normal nutritional status, while 32.9% were at risk of malnutrition and 12.1% were malnourished. The mean MNA score was 22.8 ± 3.9 , and the mean BMI was 23.4 ± 4.1 kg/m².

The association between selected variables and malnutrition is shown in Table 5. Malnutrition was significantly associated with education, marital status, financial dependency, smoking, alcohol use, presence of multiple comorbidities, and polypharmacy ($p < 0.05$). However, age group and gender were not significantly associated with malnutrition.

Sl. No.	Variables	Category	Frequency	Percentage
1	Age group (years)	60–69	148	52.85 %
		70–79	92	32.85%
		≥ 80	40	14.28%
2	Gender	Male	134	47.85%
		Female	146	52.14%
3	Marital status	Married	176	62.85%
		Widow/Widower	96	34.28%
		Divorced/Separated	8	2.85%
4	Education	Illiterate / Non Formal Education	11	3.92 %
		Primary	125	44.64%
		Middle school	81	28.92 %
		High school and above	63	22.50 %
5	Occupation	Working	86	30.71%
		Retired	74	26.42%
		Unemployed/Homemaker	120	42.85%
6	Socioeconomic status (Modified B G Prasad Classification)	Upper	18	6.42%
		Upper middle	62	22.14%
		Middle	94	33.57%
		Lower Middle	76	27.14%
		Lower	30	10.71%
7	Financial dependency	Independent	82	29.28%
		Partially dependent	94	33.57%
		Fully dependent	104	37.14%

Table 1: Sociodemographic characteristics of the study participants

Sl. No.	Variable	Category	Frequency	Percentage
1	Smoking status	Current smoker	48	17.14
		Past smoker	36	12.86
		Non-smoker	196	70
2	Alcohol consumption	Current drinker	42	15
		Past drinker	30	10.71
		Non-drinker	208	74.29
3	Number of comorbidities	None	62	22.14
		One	96	34.29
		Two or more	122	43.57
4	Medication use	≥3 drugs/day	88	31.43
		<3 drugs/day	192	68.57

Table 2: Health Characteristics of the study population

Sl. No.	Variable	No. of Participants	Percentage
1	Musculoskeletal disorders	138	49.29
2	Hypertension	102	36.43
3	Eye disorders	96	34.29
4	Diabetes mellitus	68	24.29
5	Respiratory diseases	58	20.71
6	Digestive disorders	46	16.43
7	Ear disorders	40	14.29
8	Urological disorders	34	12.14
9	Psychological disorders	28	10
10	Neurological disorders	22	7.86

Table 3: Morbidity Profile of the study Participants

*Multiple Responses possible for Morbidity variables

Sl. No.	Nutritional Status	No. of Participants	Percentage
1	Normal nutritional status (Score ≥24)	154	55
2	At risk of malnutrition (Score 17 – 23.5)	92	32.9
3	Malnourished (Score <17)	34	12.1
	Total	280	100

Table 4: Nutritional status of the study participants based on Mini Nutritional Assessment

*Mean MNA score = 22.8 ± 3.9

*Mean BMI = 23.4 ± 4.1 kg/m²

Sl. No.	Variable	Category	Malnutrition N (%)	Normal N (%)	Total	P Value
1	Age group	≥70 years	64 (48.48)	68 (51.52)	132	0.2683
		60–69 years	62 (41.89)	86 (58.11)	148	
2	Gender	Male	54 (40.30)	80 (59.70)	134	0.1298
		Female	72 (49.32)	74 (50.68)	146	
3	Education	Illiterate	62 (57.41)	46 (42.59)	108	0.0009*
		Literate	64 (37.21)	108 (62.79)	172	
4	Marital status	Living alone	34 (58.62)	24 (41.38)	58	0.0192*
		Living with spouse/family	92 (41.44)	130 (58.56)	222	
5	Financial dependency	Dependent	100 (50.51)	98 (49.49)	198	0.0040*
		Independent	26 (31.71)	56 (68.29)	82	
6	Smoking	Current/Past	46 (54.76)	38 (45.24)	84	0.0316*
		Non-smoker	80 (40.82)	116 (59.18)	196	
7	Alcohol use	Current/Past	40 (55.56)	32 (44.44)	72	0.0367*
		Non-drinker	86 (41.35)	122 (58.65)	208	
8	Comorbidities	≥2 diseases	72 (59.02)	50 (40.98)	122	0.00003*
		≤1 disease	54 (34.18)	104 (65.82)	158	
9	Medication use	≥3 drugs/day	50 (56.82)	38 (43.18)	88	0.0071*
		<3 drugs/day	76 (39.58)	116 (60.42)	192	

Table 5: Nutritional status and determinants of malnutrition among the study population

* Malnutrition includes both “malnourished” and “at risk of malnutrition”

DISCUSSION

The present cross-sectional study assessed the morbidity pattern and nutritional status among elderly individuals residing in Sullia taluk of Karnataka. The findings indicate a considerable burden of morbidity and a notable proportion of elderly individuals who were either malnourished or at risk of malnutrition.

In the present study, the majority of participants belonged to the 60–69 years age group. Similar age distribution has been reported in several community-based studies conducted among elderly populations in India. Krishnamoorthy et al[20] also observed that most participants belonged to the younger elderly age group in a study conducted in rural Puducherry. This pattern is commonly observed in community studies because mortality increases with advancing age, resulting in fewer individuals surviving into the oldest age groups.

A slight female predominance was observed in the present study. Similar findings have been reported in other Indian studies including those by Krishnamoorthy et al[20] and Simon et al[21]. The higher proportion of females among elderly populations may be attributed to the longer life expectancy of women and the greater likelihood of women being present at home during household surveys.

Musculoskeletal disorders were the most common morbidity observed in the present study, followed by hypertension and eye disorders. Similar findings have been reported in other studies among elderly populations in India. Jeyasuriya[5] also reported musculoskeletal conditions as one of the most frequently observed morbidities among elderly individuals. Age-related degenerative changes in bones and joints and prolonged physical labour in rural settings may explain the higher prevalence of musculoskeletal disorders. In addition, the increasing burden of non-communicable diseases such as hypertension and diabetes among the elderly has been widely documented in global studies.[6]

In the present study, 55% of participants had normal nutritional status, while 32.9% were at risk of malnutrition and 12.1% were malnourished. These findings are comparable with those reported by Konda et al[2] and Krishnamoorthy et al.[20] A systematic review by Kushwaha et al[19] also reported that a substantial proportion of elderly individuals in India are either malnourished or at risk of malnutrition, highlighting the importance of early identification and preventive measures.

Educational status showed a significant association with malnutrition in the present study, with a higher prevalence observed among illiterate individuals. Similar findings have been reported in previous studies where lower educational status was associated with poorer nutritional outcomes among elderly individuals.[20] Limited awareness regarding balanced diet and health-seeking behaviour may contribute to poorer nutritional status among individuals with lower educational attainment.

Marital status was also significantly associated with malnutrition, with a higher prevalence observed among elderly individuals living alone. Similar findings have been reported in studies where social isolation and lack of family support were identified as important risk factors for malnutrition among older adults.[10] Financial dependency was another factor significantly associated with malnutrition. Elderly individuals who are financially dependent may have limited access to nutritious food and healthcare, which may contribute to poorer nutritional outcomes.[11] Lifestyle factors such as smoking and alcohol consumption were also significantly associated with malnutrition in the present study. Tobacco and alcohol use may adversely affect appetite, nutrient absorption and dietary intake, thereby increasing the risk of malnutrition.[22] The presence of multiple comorbidities and polypharmacy also showed significant association with malnutrition. Similar associations have been reported in previous studies where chronic illnesses and multiple medications negatively influenced nutritional intake and overall nutritional status.[13,14] Chronic diseases may increase metabolic demands, reduce appetite or require dietary restrictions, thereby increasing the risk of malnutrition among elderly individuals.

Overall, the findings of the present study indicate that although a majority of elderly individuals had normal nutritional status, a considerable proportion were either malnourished or at risk of malnutrition. These findings emphasize the need for early nutritional screening and appropriate community-based interventions to improve the health and quality of life of the elderly population.

CONCLUSION

The present study demonstrates that a considerable proportion of elderly individuals in the rural study area were either malnourished or at risk of malnutrition, and several sociodemographic, lifestyle, and health-related factors were found to be significantly associated with nutritional status. The findings emphasize the need for routine nutritional screening among

the elderly at the community level, particularly among those who are socially or financially vulnerable and those with multiple comorbidities. Strengthening geriatric health services and promoting awareness regarding adequate nutrition may help in improving the overall health and quality of life of the ageing population.

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