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Research Article

Morbidity Profile and its Association with Sociodemographic Factors Among the Elderly in a Rural Area of Andhra Pradesh: A Community-based Cross-sectional Study

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ABSTRACT

Population ageing is accelerating in India and is accompanied by a rising burden of chronic morbidities, functional decline, and increased healthcare needs, particularly in rural areas. The objective of the current study was to assess the morbidity profile among the geriatric population in a rural field practice area and to study the association between selected sociodemographic factors and morbidity patterns among the elderly. A community-based cross-sectional study was conducted from January 2019 to December 2019 in the rural field practice area of a Medical College, Vijayawada. A total of 370 individuals aged ≥60 years were selected using systematic random sampling. Data were collected using a pre-tested semi-structured questionnaire and clinical examination. Functional status was assessed using the Katz index of activities of daily living. The data were analysed using descriptive statistical methods. Associations between variables were evaluated using the chi-square test, and factors independently associated with the outcome were identified through multivariate logistic regression analysis. Musculoskeletal disorders (85.1%), cardiovascular diseases (77.0%), and eye problems (76.2%) were the most common morbidities. Hypertension was present in 88.6% and diabetes mellitus in 46.2% of participants. Anaemia was observed in 73.8% of the elderly. Socioeconomic status, literacy status, and caregiver availability showed statistically significant associations with selected morbidities ($p < 0.05$). The study demonstrates a high burden of multimorbidity among the rural elderly. Strengthening comprehensive geriatric care at the primary healthcare level is essential to address the growing health needs of the ageing population.

Keywords: Geriatric morbidity, Rural elderly, Multimorbidity, Community-based study

INTRODUCTION

Population ageing has emerged as a major public health challenge worldwide, with low- and middle-income countries experiencing a rapid increase in the proportion of older adults. According to the World Health Organisation, the global population aged 60 years and above is expected to double between 2020 and 2050, reaching nearly 2.1 billion, with the fastest growth occurring in developing countries. This demographic transition is accompanied by an increased burden of chronic non-communicable diseases, functional limitations, and social dependency, placing substantial strain on health systems and social support structures.[1]

India is undergoing a similar demographic shift. The proportion of elderly individuals in the country has steadily increased over the past decades, with recent national estimates indicating that older adults constitute more than 10% of the total population [2]. The longitudinal ageing study in India (LASI) has highlighted that a significant proportion of older adults suffer from one or more chronic morbidities, with hypertension, diabetes mellitus, musculoskeletal disorders, visual impairment, and mental health conditions being the most prevalent [3]. Multimorbidity among the elderly has been recognised as a major determinant of poor quality of life, increased healthcare utilisation, and higher out-of-pocket expenditure [4].

Rural elderly populations are particularly vulnerable due to limited access to healthcare services, lower levels of education, economic dependency, and inadequate social support. Studies conducted in rural India have consistently reported a higher prevalence of untreated chronic conditions, delayed health-seeking behaviour, and functional dependency among older adults compared to their urban counterparts [5,6]. Furthermore, social determinants such as literacy status, socioeconomic position, and caregiver availability have been shown to significantly influence morbidity patterns and health outcomes in the geriatric population [7].

Functional status assessment is an essential component of geriatric health evaluation, as declining ability to perform activities of daily living is closely associated with increased morbidity, institutionalisation, and mortality. The Katz index of activities of daily living is widely used in community settings to assess functional independence among elderly individuals and has been recommended for use in primary healthcare and community-based studies [8].

Despite the growing burden of geriatric morbidities, there remains a paucity of region-specific data from rural areas of Andhra

Pradesh, particularly from field practice areas attached to medical colleges, which serve as critical training and service delivery points for primary healthcare. Local-level evidence on morbidity patterns and associated factors is essential for planning targeted geriatric services, strengthening primary healthcare delivery, and optimizing the implementation of national programs for elderly care.

The present study was undertaken to assess the morbidity profile of the geriatric population in the rural field practice area of a Medical College in Vijayawada, Andhra pradesh and to examine the association between selected sociodemographic factors and morbidity patterns among the elderly. Objectives of the study were: 1) To enumerate the sociodemographic profile of the study population. 2) To assess the functional status (Activities of Daily living) of the study population. 3) To study the health-seeking behaviour of the elderly. 4) To analyse the association between the sociodemographic factors and the morbidity profile of the elderly.

MATERIAL AND METHODS

A community-based cross-sectional descriptive study was carried out in the rural field practice area of the Rural Health Training Centre attached to a Medical College in Vijayawada. The study was carried out over a period of one year, from January 2019 to December 2019. The study population comprised individuals aged 60 years and above, who had been permanent residents of the study area for a minimum period of 6 months. The sample size for the present study was calculated based on findings from a community-based study conducted in Visakhapatnam, Andhra Pradesh, by Srinivas PJ *et al*.[9] which reported a prevalence of morbidity among the elderly of 64%.

Using this prevalence, the sample size was estimated employing the standard formula for single population proportion, $n = 4pq/L^2$, where p represents the prevalence (64%), q is $1-p$ (36%), and L is the allowable error set at 5% with a 95% confidence level. The calculated sample size was 368.64, which was rounded off to 370. Accordingly, a total of 370 elderly individuals were included in the study.

Households were selected using a systematic random sampling technique, and all eligible elderly individuals in the selected households were included in the study. The total number of households in the study area was 1,856, and a sampling interval (k) of 5 was calculated by dividing the total households by the required sample size of 370. A village transect map was prepared to list households based on locality. From a strategically chosen starting point, the first household was selected randomly, and thereafter every fifth household was visited following the right-hand rule. In households where no eligible individual aged 60 years or above was available at the time of visit, the next household was approached. This process was continued until the desired sample size of 370 was achieved. In households with more than one eligible elderly individual, one respondent was selected by simple random sampling using the lottery method, and data were collected through interview and clinical examination using a pre-tested study proforma.

Data were collected using a pre-tested semi-structured questionnaire to collect information on sociodemographic characteristics, health-seeking behaviour, morbidity profile, and functional status. In addition to the interview, a basic clinical examination was conducted, and available medical records were reviewed to corroborate self-reported morbidities wherever feasible. The collected data were entered into Microsoft Excel and analysed using IBM SPSS version 21.0. Descriptive statistics were used to summarise the study findings and were expressed as frequencies, proportions, and percentages. Associations between selected variables were assessed using the chi-square test, and a *p-value* of <0.05 was considered statistically significant. Variables found to be significant on bivariate analysis were further analyzed using multivariate logistic regression to identify independent predictors of morbidity.

Ethical approval for the study was obtained from the Institutional Ethics Committee. Informed verbal consent was obtained from all study participants before data collection, and strict confidentiality of the information was maintained throughout the study.

RESULTS

A total of 370 elderly individuals aged ≥60 years were included in the final analysis. All selected participants consented and completed the interview and a clinical examination was done. There were no exclusions after enrolment.

The mean age of the participants was 65.97 ± 5.61 years, with their age ranging from 60 to 91 years. The majority belonged to the 60 to 69 years age group (74.9%). Females constituted 70.3% of the study population. A high level of illiteracy was observed (74.9%), particularly among females. Most participants were unemployed at present (87.6%) and belonged to socioeconomic classes (Class III

Table 1: Sociodemographic characteristics of the study population (n = 370)

Variable	*Category*	*n (%)*
Age group (years)	60–64	143 (38.6)
	65–69	134 (36.2)
	≥70	93 (25.2)
Gender	Male	110 (29.7)
	Female	260 (70.3)
Literacy status	Illiterate	277 (74.9)
	Literate	93 (25.1)
Socioeconomic class*	Class I	5 (1.4)
	Class II	10 (2.7)
	Class III	133 (35.9)
	Class IV	162 (43.8)
	Class V	60 (16.2)
Living arrangement	Alone	95 (25.7)
	With family	275 (74.3)

(*Based on Modified B.G.Prasad classification for 2019)

Table 2: Functional status of the elderly using Katz ADL scale

Katz ADL score	*Interpretation*	*n (%)*
6	Fully independent	331 (89.5)
5	Mild dependency	30 (8.1)
≤4	Moderate–severe dependency	9 (2.4)

and IV: 79.7%) as per the modified BG Prasad classification. Nearly 25.7% of elderly participants lived alone, while 40% lived in three-generation families (Table 1).

Functional status assessed using the Katz index of activities of daily living (ADL) [8] showed that 89.5% of participants were functionally independent (score = 6). Functional dependency increased with advancing age, with all individuals having a Katz score ≤4 belonging to the ≥80-year age group (Table 2).

Most participants (71.4%) sought treatment from government health facilities, while 28.6% preferred private practitioners. Among those avoiding government facilities, the most commonly reported reason was unsatisfactory behaviour of staff (73.6%), followed by non-availability of medicines (26.4%). Awareness of the state pension scheme was high (98.9%), and 72.7% were availing of the benefits (Table 3).

Central nervous system disorders and anaemia were significantly more prevalent among female elderly compared to males (p = 0.045 and p <0.001, respectively). Although a higher proportion of females reported cardiovascular, respiratory, musculoskeletal, and ophthalmological morbidities, these differences did not reach statistical significance (Table 4).

Elderly individuals belonging to lower socioeconomic classes (Class IV–V) had a significantly higher prevalence of cardiovascular, central nervous system, respiratory, ophthalmological, and endocrine disorders compared to those from the upper socioeconomic class (Class I-III) (p <0.001 for all). Multimorbidity was also significantly more common among individuals from lower socioeconomic backgrounds (Table 5).

Illiterate elderly participants exhibited a significantly higher burden of cardiovascular diseases, eye disorders, central nervous system disorders, gastrointestinal morbidities, and anaemia compared to their literate counterparts (p <0.01 for all morbidities), indicating a strong association between illiteracy and adverse health outcomes in old age (Table 6).

The absence of a caregiver was significantly associated with a higher prevalence of cardiovascular diseases, neurological disorders, respiratory illnesses, eye disorders, and psychological morbidity among the elderly (p <0.01 for all), highlighting the protective role of caregiver support in geriatric health (Table 7).

On multivariate logistic regression analysis, lower socioeconomic status (AOR = 2.36), illiteracy (AOR = 2.11), absence of a caregiver (AOR = 3.18), and age ≥70 years (AOR = 1.76) were identified as independent predictors of cardiovascular morbidity among the elderly, while female gender did not show a statistically significant independent association (Table 8).

Table 3: Health-seeking behaviour of the elderly

Variable	*Category*	*n (%)*
Preferred health facility	Government	264 (71.4)
	Private	106 (28.6)
Reason for avoidance of government facility (n=106)	Staff behavior	78 (73.6)
	Medicines unavailable	28 (26.4)
Aware of the pension scheme	Yes	366 (98.9)
Availing pension	Yes	269 (72.7)

Table 4: Association of gender with system-wise morbidity among the elderly

System-wise morbidity	*Male (n = 110) n (%)*	*Female (n = 260) n (%)*	χ^2 *value*	*p-value*
Cardiovascular system	79 (71.8)	206 (79.2)	2.41	0.12
Central nervous system	38 (34.5)	118 (45.4)	4.01	**0.045**
Respiratory system	29 (26.4)	93 (35.8)	3.31	0.069
Musculoskeletal system	88 (80.0)	227 (87.3)	3.02	0.082
Eye disorders	77 (70.0)	205 (78.8)	3.38	0.066
Anaemia	64 (58.2)	209 (80.4)	19.6	**<0.001**

DISCUSSION

The present community-based study highlights a substantial burden of morbidity among the geriatric population residing in a rural field practice area of Andhra Pradesh. More than four-fifths of the elderly had at least one chronic morbidity, emphasizing the growing public health challenge posed by population ageing in rural India.

Sociodemographic Profile and Ageing Pattern

The predominance of females and the higher proportion of widowed elderly observed in this study are consistent with findings from recent Indian community-based studies, reflecting increased female life expectancy and gender-specific social vulnerabilities in later life. [5,10] Similar gender patterns have been reported in rural elderly populations from other low- and middle-income countries, suggesting a global trend of feminization of ageing[11]

Table 5: Association of socioeconomic status with system-wise morbidity among the elderly

Morbidity	*Upper SES (Class I-III) n=133 n (%)*	*Lower SES (Class IV–V) n=237 n (%)*	χ^2	*p-value*
Cardiovascular diseases	88 (66.2)	197 (83.1)	14.9	<0.001
CNS disorders	39 (29.3)	117 (49.4)	15.7	<0.001
Respiratory diseases	29 (21.8)	93 (39.2)	12.8	<0.001
Eye disorders	86 (64.7)	196 (82.7)	15.2	<0.001
Endocrine disorders (DM)	44 (33.1)	127 (53.6)	14.6	<0.001
Multimorbidity (≥2 conditions)	74 (55.6)	181 (76.4)	18.4	**<0.001**

Table 6: Association of literacy status with selected morbidities among the elderly

Morbidity	*Illiterate (n = 277) (%)*	*Literate (n = 93) (%)*	χ^2	*p-value*
Cardiovascular diseases	228 (82.3)	57 (61.3)	16.8	<0.001
Eye disorders	231 (83.4)	51 (54.8)	28.1	<0.001
CNS disorders	136 (49.1)	20 (21.5)	21.9	<0.001
Gastrointestinal disorders	94 (33.9)	16 (17.2)	9.4	0.002
Anaemia	226 (81.6)	47 (50.5)	31.7	<0.001

Table 7: Association of caregiver availability with morbidity profile among the elderly

Morbidity	*Caregiver present (n = 275) n (%)*	*No Caregiver (n = 95) n (%)*	χ^2	*p-value*
Cardiovascular diseases	198 (72.0)	87 (91.6)	15.1	<0.001
CNS disorders	93 (33.8)	63 (66.3)	31.9	<0.001
Respiratory diseases	79 (28.7)	43 (45.3)	8.9	0.003
Eye disorders	191 (69.5)	91 (95.8)	27.6	<0.001
Psychological morbidity	41 (14.9)	36 (37.9)	22.4	<0.001

The high level of illiteracy and concentration of participants in lower socioeconomic classes observed in the present study aligns with evidence from other rural Indian settings, where social disadvantage continues into old age and significantly influences health outcomes[4,12]

Morbidity Profile and Multimorbidity

Musculoskeletal disorders emerged as the most prevalent morbidity in the present study, followed by cardiovascular diseases and eye problems. Comparable findings have been reported in recent Indian studies conducted in rural Maharashtra, Tamil Nadu, and Uttar Pradesh, where joint pains, arthritis, and mobility-related problems were the leading causes of morbidity among the elderly [5,10,13]. These conditions substantially impair functional independence and contribute to reduced quality of life.

Table 8: Multivariate logistic regression analysis of factors associated with cardiovascular morbidity among the elderly

Variable	*Adjusted OR**	*95% CI*	*p-value*
Female sex	1.42	0.89–2.28	0.13
Lower SES	2.36	1.41–3.96	0.001
Illiteracy	2.11	1.25–3.56	0.005
No caregiver	3.18	1.59–6.34	0.001
Age ≥70 years	1.76	1.03–3.01	0.038

(*Adjusted OR=Adjusted odd's ratio)

Hypertension was the most common cardiovascular morbidity identified, with a large proportion of cases either uncontrolled or newly diagnosed. Similar high prevalence of hypertension among rural elderly has been documented in recent Indian studies, underscoring gaps in early detection and long-term management [7,10]. International studies from China, Brazil, and sub-Saharan Africa have also reported hypertension as the dominant chronic condition among older adults, highlighting its universal burden [14-16].

The high prevalence of diabetes mellitus and other endocrine disorders observed in this study is consistent with findings from the longitudinal ageing study in India and other recent Indian community-based research, indicating a rapid epidemiological transition even in rural areas.[4,7] Comparable trends have been reported from middle-income countries, suggesting convergence of rural and urban risk profiles globally [15].

Anaemia and Nutritional Vulnerability

Anaemia was observed in nearly three-fourths of the elderly participants, with a markedly higher prevalence among females. Recent Indian studies have similarly reported a high burden of anaemia among older adults, particularly women, attributing it to nutritional deficiencies, chronic disease, and poor healthcare utilisation.[7,13] Studies from other countries have also demonstrated a strong association between anaemia, functional decline, and increased morbidity among the elderly.[11,16]

Functional Status and Caregiver Support

The majority of participants in the present study were functionally independent; however, functional dependency increased with advancing age. This age-related decline in activities of daily living has been consistently reported in Indian studies using the Katz ADL scale [4, 10]. International research has further demonstrated that functional impairment is closely linked to multimorbidity and social isolation among older adults [14, 15].

The presence of a caregiver was significantly associated with lower prevalence of selected morbidities and better psychological well-being. Similar associations have been documented in Indian studies, where family support plays a critical role in healthcare access and continuity of care for the elderly [5,12]. Comparable findings from non-Indian studies reinforce the importance of social support systems in mitigating adverse health outcomes in ageing populations [11,16].

Health-seeking Behaviour

The preference for government healthcare facilities observed in the present study reflects reliance on public health services among rural elderly populations. However, dissatisfaction with service quality and medicine availability remains a barrier, as reported in other Indian studies [12,13]. International studies from primary care settings have similarly identified healthcare accessibility and provider behavior as key determinants of health-seeking behaviour among older adults [14,15].

LIMITATIONS

The cross-sectional design limits causal inference between sociodemographic factors and morbidity. Some conditions were

assessed clinically without laboratory confirmation, which may have led to under- or over-estimation of certain morbidities.

CONCLUSION

The study demonstrates a high burden of multimorbidity among the rural geriatric population. Strengthening primary healthcare services with a focus on comprehensive geriatric assessment, early detection of chronic diseases, and caregiver support is essential to improve health outcomes among older adults in rural India.

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CONFLICT OF INTEREST

None.

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