



## Original Research Article

# MORBIDITY PATTERN AMONG ELDERLY INMATES OF OLD AGE HOMES IN RURAL BENGALURU: A CROSS-SECTIONAL STUDY

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### ABSTRACT

**Background:** Ageing is a natural and inevitable biological process associated with progressive decline in physiological functions and increased susceptibility to chronic diseases. With improvements in healthcare and life expectancy, the proportion of elderly individuals is increasing globally as well as in India. Elderly inmates of old age homes constitute a vulnerable group with multiple medical, social, and psychological problems. The present study was conducted to assess the morbidity pattern of elderly inmates residing in old age homes in rural Bengaluru

**Materials and Methods:** A descriptive cross-sectional study was conducted among 116 elderly inmates residing in five old age homes located in the rural field practice area of KIMS Bengaluru. The study was carried out over a period of 6 months. Data was collected using a pretested semi-structured questionnaire through interview method, clinical examination, and review of medical records. Data was using analysed using descriptive and inferential statistical methods.

**Results:** The mean age of the study participants was  $72.4 \pm 7.6$  years, with females constituting 61.3%. Majority were widowed (53.4%), illiterate (36.2%), and financially dependent (80.2%). Loneliness (41.4%) was the most common reason for admission. Overall, 92.2% of the study participants had one or more morbidities. The most prevalent morbidities included arthritis (65.5%), anaemia (49.1%), vision defects (46.5%), hypertension (44.8%), diabetes mellitus (39.6%), and depression (36.2%).

**Conclusion:** There is a high burden of multiple morbidities among elderly inmates of old age homes. Regular geriatric health services, mental health support, and periodic screening programmes are essential to improve their quality of life.

**Keywords:** Elderly, Morbidity pattern, Old age homes, Institutionalized aged, Geriatric health.

## INTRODUCTION

Ageing is a universal and irreversible biological process characterized by progressive decline in physiological reserve and increased vulnerability to disease and disability. Globally, population ageing is accelerating at an unprecedented pace. According to the World Health Organization (WHO), the number of people aged 60 years and above is expected to double by 2050, reaching over 2 billion worldwide.<sup>[1]</sup> This demographic transition is particularly rapid in low- and middle-income countries, where health

systems are often inadequately prepared to address the complex needs of older adults.<sup>[2]</sup>

India is experiencing a similar shift in population structure. Data from the United Nations Population Fund (UNFPA) and the Government of India indicate a steady rise in the proportion of elderly persons, driven by declining fertility rates and increasing life expectancy.<sup>[3,4]</sup> The Longitudinal Ageing Study in India (LASI) further highlights the growing burden of chronic diseases, functional limitations, and dependency among older adults.<sup>[5]</sup> With increasing longevity, the epidemiological transition from

communicable to non-communicable diseases has become more pronounced, resulting in a higher prevalence of hypertension, diabetes mellitus, cardiovascular diseases, musculoskeletal disorders, sensory impairments, and mental health conditions among the elderly.<sup>[6]</sup>

Multimorbidity, defined as the coexistence of two or more chronic conditions in an individual, is increasingly recognized as a major public health concern in ageing populations.<sup>[1]</sup> Older adults with multimorbidity often experience polypharmacy, reduced functional capacity, higher healthcare utilization, and poorer quality of life.<sup>[7]</sup> The cumulative effect of chronic physical conditions, coupled with psychosocial stressors such as bereavement, social isolation, and financial insecurity, further compounds their vulnerability.<sup>[8]</sup> Traditionally, the joint family system in India provided social, emotional, and economic support to older family members. However, rapid urbanization, migration, changing occupational patterns, and evolving sociocultural norms have contributed to the gradual weakening of traditional support systems.<sup>[4]</sup> As a result, an increasing number of elderly individuals are residing in old age homes, either due to lack of caregivers, strained family relationships, poverty, or loneliness.<sup>[3]</sup> Institutionalized elderly constitute a particularly vulnerable group, as they often enter such facilities with pre-existing illnesses and limited social support.

Recognizing the growing health needs of the elderly, the Ministry of Health and Family Welfare launched the National Programme for Health Care of the Elderly (NPHCE) to provide dedicated geriatric services at primary, secondary, and tertiary levels.<sup>[9]</sup> In addition, the Ministry of Social Justice and Empowerment has implemented schemes aimed at ensuring social security and welfare for senior citizens.<sup>[10]</sup> Despite these initiatives, gaps remain in the delivery of comprehensive geriatric care, particularly within institutional settings in rural areas. Understanding the morbidity profile of elderly residents in old age homes is essential for planning targeted preventive, promotive, and rehabilitative services. However, limited community-based data are available regarding the health status of institutionalized elderly in rural Karnataka. The present study was therefore undertaken to assess the morbidity pattern and socio-demographic characteristics of elderly inmates residing in old age homes in rural Bengaluru.

## **MATERIALS AND METHODS**

A descriptive cross-sectional study was conducted among elderly individuals aged 60 years and above residing in five old age homes located in the rural field practice area of the Department of Community Medicine, Kempegowda Institute of Medical Sciences (KIMS), Bengaluru, Karnataka. The study was carried out over a period of six months from

January to June 2018. Ethical clearance was obtained from the Institutional Ethics Committee prior to initiation of the study. Formal approval to conduct the study was obtained from the management authorities of the respective old age homes. Written informed consent was taken from all participants before enrolment into the study.

All elderly residents aged 60 years and above who were residing at the selected old age home during the study period were considered eligible. A universal sampling approach was followed, and all residents who met the inclusion criteria and consented to participate were included in the study. Individuals who were critically ill, unable to communicate effectively, or unwilling to participate were excluded. Data was collected using a pretested semi-structured questionnaire administered through face-to-face interviews. Information regarding socio-demographic characteristics, educational status, marital status, financial dependency, and reasons for admission to the old age homes was obtained. A comprehensive clinical examination was performed for each participant, and available medical records and prescriptions were reviewed to verify previously diagnosed chronic conditions.

Blood pressure was measured using a calibrated mercury sphygmomanometer following standard guidelines. Measurements were taken in the sitting position after at least five minutes of rest, with the arm supported at heart level. Two readings were recorded five minutes apart, and the average value was used for analysis. Hypertension was defined as systolic blood pressure  $\geq 140$  mmHg and/or diastolic blood pressure  $\geq 90$  mmHg, or current use of antihypertensive medication, in accordance with the recommendations of the Eighth Joint National Committee (JNC 8).<sup>[11]</sup>

Random blood glucose levels were assessed using a standardized glucometer under aseptic precautions. Diabetes mellitus was defined as a random blood glucose value  $\geq 200$  mg/dL in the presence of classical symptoms, or a prior physician diagnosis, or current use of antidiabetic medication, based on World Health Organization (WHO) criteria.<sup>[12]</sup>

Haemoglobin estimation was carried out using standard laboratory techniques available at the affiliated hospital. Anaemia was defined according to WHO cut-off values as haemoglobin  $< 13$  g/dL in men and  $< 12$  g/dL in women.<sup>[13]</sup>

Visual acuity was assessed using a standard Snellen's chart placed at a distance of six meters in adequate illumination, with each eye tested separately. Visual impairment was classified according to the WHO 2018 definitions, wherein presenting visual acuity worse than 6/18 in the better eye was considered visual impairment.<sup>[14]</sup> Hearing was screened using the whispered voice test conducted in a quiet environment, with each ear assessed individually after providing clear instructions to the participant. The whispered voice test is considered a simple and practical screening method for detecting hearing impairment in community-based settings.<sup>[15]</sup>

Depressive symptoms were evaluated using the validated Geriatric Depression Scale – Short Form (GDS-15) Kannada version. A score of five or more was considered indicative of depression. The GDS-15 is a widely accepted screening instrument for assessing depression among elderly populations.<sup>16</sup> Chronic cardiovascular diseases, respiratory illnesses, neurological disorders, and malignancies if any were documented based on prior medical diagnosis and treatment records. Participants identified with newly detected or uncontrolled

conditions during the examination were referred to the hospital for further evaluation and confirmation of diagnosis.

The collected data was entered into Microsoft Excel and analysed using SPSS software version 16. Descriptive statistics such as frequencies, percentages, mean, and standard deviation were calculated. The association between socio-demographic variables and multimorbidity was assessed using the Chi-square test, and a p-value of less than 0.05 was considered statistically significant.

## RESULTS

A total of 127 elderly residents were living in five old age homes situated in the rural field practice area of KIMS, Bengaluru. Of these, 116 inmates participated in the study, while 11 were excluded due to critical illness or lack of consent.

**Table 1: Socio-demographic profile of elderly inmates of old age homes.**

Socio-demographic variables (n=116)		Frequency(%)
Age (in years)	60-69	49(42.2)
	70-79	39(33.6)
	≥ 80	28(24.2)
Gender	Male	45(38.8)
	Female	71(61.3)
Education status	Illiterate	41(36.2)
	Primary	28(24.1)
	Secondary	35(30.2)
	Graduate	11(9.5)
Marital status	Married	28(24.1)
	Widow/ Widower	62(53.4)
	Unmarried	19(16.4)
	Divorced	7 (6.1)
Religion	Hindus	107(92.2)
	Christians	6(5.2)
	Muslims	3(2.6)
Financial Status	Independent	23(19.8)
	Dependent on families	93(80.2)

The mean age of the study participants was 72.4 ± 7.6 years. The majority of elderly inmates belonged to the 60–69 years age group, followed by those aged 70–79 years and ≥80 years. Females constituted the majority of the study population. Regarding educational status, over one-third of the participants

were illiterate. More than half of the inmates were widowed or widowers. The majority of the participants were Hindus and substantial proportion of the elderly were financially dependent on their families.

**Table 2: Distribution of study population according to number of morbidities.**

Number of health problems per person (n=116)			
None	Single	Two	≥Three
9(7.8%)	19(16.4%)	32(27.6%)	56(48.3%)

The overall morbidity burden was high, with 92.2% of the elderly inmates having one or more health problems. Only 7.8% of the participants were free from any morbidity. Nearly half of the inmates

(48.3%) were suffering from three or more morbidities, while 27.6% had two morbidities and 16.4% had a single morbidity. [Table 2]

**Table 3: Morbidity profile of the elderly inmates of old age homes.**

Health problem (n=116)	Frequency (%)
Arthritis	76 (65.5)
Anemia	57 (49.1)
Vision defect	54 (46.5)
Hypertension	52 (44.8)
Diabetes mellitus	46 (39.6)
Depression	42 (36.2)
Hearing impairment	36 (31.1)
Cardio vascular disease	14 (12.1)

Respiratory disease	9 (7.7)
Neurological disease	4 (3.4)
Cancer	2 (1.7)

The most common morbidity observed was arthritis, affecting 65.5% of the inmates. Anaemia was the second most prevalent condition (49.1%), followed by visual impairment (46.5%). Non-communicable diseases were also highly prevalent, with hypertension reported in 44.8% and diabetes mellitus in 39.6% of the participants. Depression was

identified in 36.2% of the elderly inmates based on the Geriatric Depression Scale (GDS-15). Hearing impairment was present in 31.1% of the participants. Less common morbidities included cardiovascular diseases (12.1%), respiratory diseases (7.7%), neurological disorders (3.4%), and malignancy (1.7%). [Table 3]

**Table 4: Age and sex wise distribution of number of morbidities among study population.**

Socio-demographic variables (n=116)		Elders with health problems					$\chi^2$ , p - value
		None	Single	Two	≥Three	Total	
Age (in Years)	60-69	5	10	15	19	49	15.7, < 0.05
	70-79	3	7	10	19	39	
	≥ 80	1	2	7	18	28	
Gender	Male	7	12	9	17	45	12.4
	Female	2	8	21	40	71	<0.05

Analysis of multimorbidity in relation to age revealed that the proportion of elderly with multiple morbidities increased with advancing age. Among participants aged ≥80 years, 64.3% had three or more morbidities, compared to 48.7% in the 70–79 years age group and 38.8% in the 60–69 years age group. This association between age and number of morbidities was found to be statistically significant ( $\chi^2 = 15.7$ ,  $p < 0.05$ ).

Similarly, gender-wise analysis showed that females had a higher burden of multimorbidity compared to males. More than half of the female inmates (56.3%) had three or more morbidities, whereas only 37.8% of males had three or more morbidities. This association between gender and multimorbidity was also statistically significant ( $\chi^2 = 12.4$ ,  $p < 0.05$ ). [Table 4]

**Table 5: Reasons for admission to old age homes**

Reason for admission to old age homes (n=116)	Frequency (%)
Loneliness	48(41.4)
Strained relation with family	31(26.7)
Low economic condition	13(11.2)
Health issues	11(9.5)
No Accommodation	9(7.8)
Physical disability	4(3.4)

The most commonly reported reason for admission to old age homes was loneliness, reported by 41.4% of the inmates. This was followed by strained relationships with family members (26.7%). Other reasons included poor economic condition (11.2%), health-related issues (9.5%), lack of accommodation (7.8%), and physical disability (3.4%). [Table 5]

## DISCUSSION

The present study provides insights into the sociodemographic characteristics and morbidity profile of elderly residents living in old age homes in rural Bengaluru. Institutionalized elderly represent a socially and medically vulnerable population, often experiencing multiple chronic morbidities and psychosocial challenges. These issues are influenced by demographic transition and changing family structures in India, highlighting the need for focused geriatric care services.<sup>[17]</sup>

In the present study, the mean age of the inmates was  $72.4 \pm 7.6$  years, with the majority belonging to the 60–69 years age group. Similar age distributions have been reported among institutionalized elderly

populations in India.<sup>[18]</sup> The predominance of the younger-old group may suggest earlier institutionalization driven by social and economic circumstances rather than extreme old age alone. Urban migration of younger family members, shrinking household sizes, and reduced caregiving capacity within families may contribute to the earlier placement of elderly individuals in residential facilities.

Females constituted the majority of residents in the present study, and widowhood was common. Similar observations have been reported from Karnataka. Lena et al. documented female predominance and high widowhood rates among elderly in Udupi taluk.<sup>[19]</sup> George et al. in Raichur district also reported that elderly women outnumbered men, largely due to higher life expectancy and social vulnerability.<sup>[20]</sup> Studies conducted in old age homes in Belgaum and Davangere similarly observed that a large proportion of residents were widowed women lacking adequate family support.<sup>[21,22]</sup> The longer life expectancy of women and their greater likelihood of surviving their spouses may partly explain this trend. Additionally, widowed women often experience financial

dependency and social isolation, increasing their likelihood of institutionalization.

Low literacy levels and financial dependency were also prominent in the present study. Educational disadvantage and socioeconomic insecurity are recognized determinants of poor health outcomes among elderly populations.<sup>[19,20]</sup> Residents of old age homes often belong to marginalized backgrounds with limited access to preventive healthcare before institutionalization. Such disadvantages may delay diagnosis and treatment of chronic illnesses, thereby contributing to a higher morbidity burden at the time of admission.

With regard to morbidity, more than ninety percent of participants had at least one chronic condition, and nearly half experienced multimorbidity. Comparable high morbidity prevalence has been documented in Karnataka. Lena et al. reported that the majority of elderly individuals had multiple health problems.<sup>[19]</sup> George et al. similarly observed clustering of chronic diseases among rural elderly populations.<sup>[20]</sup> Institutional studies from Bengaluru have also highlighted substantial disease burden among old age home residents.<sup>[23]</sup> The high prevalence of multimorbidity may reflect cumulative exposure to age-related physiological decline, lifestyle risk factors, and limited access to preventive healthcare earlier in life.

Musculoskeletal disorders, particularly arthritis, were the most common morbidity observed in the present study. Degenerative joint disease is widely reported as a leading cause of morbidity among elderly populations in South India.<sup>[24]</sup> Chronic pain and reduced mobility may impair activities of daily living and increase dependency. In institutional environments, limited physical activity and sedentary lifestyles may further aggravate joint stiffness and disability, highlighting the need for physiotherapy-based interventions.

Anaemia was present in nearly half of the inmates in the present study, which is comparable to findings reported by Bharati et al.<sup>[25]</sup> Nutritional deficiencies, chronic illnesses, and socioeconomic factors are known contributors to anaemia among elderly individuals.

Hypertension and diabetes mellitus were also highly prevalent. Rural Karnataka studies have consistently documented cardiovascular risk factors as dominant morbidities among elderly populations.<sup>[20,26]</sup> Institutional research from Bengaluru similarly reported diabetes and hypertension as common conditions among inmates.<sup>[23]</sup> The coexistence of these metabolic disorders increases cardiovascular risk and complicates disease management due to polypharmacy.

Sensory impairments, particularly visual impairment, were also common findings. Visual impairment remains a major but largely preventable cause of disability among older adults in India. Marmamula et al. reported high prevalence of uncorrected refractive errors and cataract among elderly populations.<sup>[27]</sup> Sensory deficits can significantly affect

independence, mobility, and social interaction, particularly within institutional settings.

Depression was identified in more than one-third of the participants. Psychological morbidity among elderly individuals has been documented in Karnataka. Nair et al. reported considerable prevalence of depression among elderly in Mangalore, particularly among women and those with chronic diseases.<sup>[28]</sup> Institutional living may intensify loneliness, bereavement stress, and perceived loss of autonomy, thereby increasing vulnerability to depressive symptoms. These findings emphasize the importance of integrating mental health services within geriatric care programmes in residential institutions.

Multimorbidity increased with advancing age and was more common among females in the present study. Similar gender differentials have been reported in Karnataka-based research.<sup>[19,20]</sup> The accumulation of chronic conditions with ageing results in complex clinical profiles requiring integrated management strategies rather than single-disease approaches.<sup>[29]</sup> Comprehensive geriatric assessment models are therefore essential in institutional care settings.

## CONCLUSION

The study identified a substantial burden of multimorbidity among elderly residents of old age homes, with most inmates experiencing multiple chronic conditions. Loneliness and strained family relationships were key reasons for institutionalization. The findings emphasize the need for comprehensive geriatric services, including regular screening, early diagnosis, continuous medical care, and mental health support. Strengthened implementation of the National Programme for Health Care of the Elderly and coordinated efforts involving healthcare providers, social welfare departments, and community support systems is crucial to improve quality of life among institutionalized elderly individuals.

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