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Comorbidities and Functional Status of Elderly Patients Attending an Urban Health Centre in Central India: A Cross-Sectional Study

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ABSTRACT

Introduction: The growing proportion of the elderly population has led to an increased need for comprehensive geriatric healthcare services across the globe. Older adults frequently experience multiple chronic conditions such as hypertension, chronic obstructive pulmonary disease (COPD), diabetes mellitus, and arthritis, which adversely influence their overall quality of life. Evaluation of functional ability through standardized tools such as the Basic Activities of Daily Living (BADL) and Instrumental Activities of Daily Living (IADL) scales plays a crucial role in estimating morbidity and mortality risks in this age group. Therefore, the present study was undertaken to assess the prevalence of comorbidities and evaluate the functional status of the geriatric population.

Methods: A descriptive cross-sectional study was carried out between January 2025 and December 2025 at a Urban health centre in India among individuals aged 60 years and above. A total of 846 participants were enrolled in the study. Information regarding socio-demographic characteristics and existing comorbidities was collected, while functional status was assessed using the Katz Index of Independence in Activities of Daily Living and the Lawton-Brody Instrumental Activities of Daily Living Scale. The collected data were compiled and analysed using SPSS software.

Results: Among the 846 study participants attending the outpatient department, 376 (44.44%) were men and 470 (55.56%) were women. Assessment using the Katz Index revealed that 754 participants (89.13%; 95% CI: 85.76%–91.93%) were independent in performing basic activities of daily living. Evaluation with the Lawton-Brody scale demonstrated that 340 participants (40.19%; 95% CI: 35.48%–45.03%) were independent in instrumental activities of daily living. Additionally, 368 (43.50%) participants were found to have one or more comorbid conditions.

Conclusions: The majority of the geriatric participants maintained independence in performing basic activities of daily living according to the Katz Index, whereas approximately two-fifths were functionally independent in instrumental activities of daily living as assessed by the Lawton-Brody scale.

Keywords: *comorbidity, functional status, geriatrics.*

INTRODUCTION

Increasing life expectancy has resulted in a steady expansion of the global geriatric population.[1] The number of older adults worldwide is projected to increase from 1 billion in 2020 to approximately 1.4 billion by 2030.[2] In South Asia, older individuals are expected to constitute nearly 10% of the total population by 2025.[3]

According to the India Ageing Report 2023, older adults (aged ≥60 years) constituted approximately 10.1% of India's population in 2021. This proportion is expected to increase to 15% by 2036 and 20.8% by 2050, highlighting the growing

need for geriatric healthcare service.[4] The World Health Organization (WHO) also estimates that the global population aged over 60 years will reach 1.4 billion by 2030, thereby increasing the demand for geriatric healthcare services and the management of chronic illnesses.[5] Continued advances in medical science and healthcare technology are expected to further contribute to this demographic transition.[6]

Older adults frequently suffer from multiple chronic medical conditions, with hypertension, diabetes mellitus (DM), and chronic obstructive pulmonary disease (COPD) being among the most prevalent comorbidities in India.[7] Functional assessment using standardized instruments, including the Katz Index of Basic Activities of Daily Living (BADL) and the Lawton Instrumental Activities of Daily Living (IADL) Scale, is an important component of comprehensive geriatric evaluation. These tools provide valuable information regarding an individual's level of independence and have been shown to be useful predictors of morbidity and mortality among the elderly population.[8]

The Urban Health Centre (UHC) serves as an important field practice area of the Department of Community Medicine, providing comprehensive primary healthcare services to the urban population. In addition to preventive, promotive, and curative healthcare, the UHC caters to a significant number of elderly patients who visit for the management of chronic illnesses, routine health check-ups, medication refills, and geriatric health concerns. As a primary healthcare facility, the UHC offers an ideal setting for understanding the health needs of the geriatric population and for conducting community-based research and interventions aimed at improving the quality of life of older adults.

Hence, the present study was undertaken to determine the prevalence of comorbidities and functional independence among older adults at a UHC in India.

METHODS

A descriptive cross-sectional study was carried out between January to December 2025 for a period of 1 year

The study was conducted at the Urban Health Centre (UHC), the urban field practice area of the Department of Community Medicine attached to Government Medical College. The UHC caters to the healthcare needs of the urban population by providing comprehensive primary healthcare services, with a considerable proportion of attendees comprising elderly patients seeking care for chronic diseases and other geriatric health problems.

The study included geriatric patients aged more than 60 years. Comorbidity was defined as the coexistence of two or more physician-diagnosed diseases in the same individual.[9]

To obtain the maximum possible sample size, the prevalence of functional independence assessed by both the Katz and Lawton scales was assumed to be 50%. The required sample size was calculated using the following formula:

$$n = \frac{Z^2 \times p \times q}{e^2}$$
$$= \frac{1.96^2 \times 0.50 \times 0.50}{0.05^2}$$
$$= 384$$

Where:
Z = 1.96 (95% confidence level)
p = 50% (0.5)
q = 1 − p = 0.5
e = allowable error of 5%

The minimum calculated sample size was 384 participants. After accounting for a 10% non-response rate, the required sample size was 423. To improve the precision of the estimates, a total of 846 eligible participants were enrolled in the study. Convenience sampling was employed for participant recruitment. All consenting geriatric patients attending the outpatient department (OPD) during the study period were considered eligible. Individuals aged over 60 years who visited the OPD and provided written informed consent were included in the study, whereas those who declined participation or were unable to provide consent were excluded.

Functional status was evaluated using the Katz Index of Independence in Basic Activities of Daily Living (BADL), which measures an individual's ability to independently perform six essential self-care activities, namely bathing, dressing, toileting, transferring, continence, and feeding. A Katz score of 6 indicated complete independence, a score of 4 represented moderate dependence, and scores ranging from 0 to 2 denoted severe dependence.[10]

Assessment of higher-level functional ability was performed using the Lawton-Brody Instrumental Activities of Daily Living (IADL) Scale. This instrument evaluates eight domains of independent living, including telephone use, shopping,

food preparation, housekeeping, laundry, transportation, medication management, and financial management. Scores range from 0 to 8, with higher scores reflecting greater functional independence and lower scores indicating reduced ability to live independently.[11] Body mass index (BMI) was categorized according to the Asian BMI classification guidelines.[12]

Written informed consent was secured from every participant before enrolment. Data were collected using a structured, pretested questionnaire. Information regarding socio-demographic characteristics—including age, sex, educational status, occupation, marital status, height, weight, smoking habits, alcohol consumption, medication history, physician-diagnosed illnesses, and comorbidities—was recorded. The questionnaire also incorporated items required for assessment using both the Katz and Lawton functional scales. All collected data were entered into Microsoft Excel and subsequently analysed using SPSS 16. Descriptive statistical methods were applied to summarize the findings, and results were presented with corresponding 95% confidence intervals.

RESULTS

A total of 846 geriatric participants attending the outpatient department (OPD) were enrolled in the study. Of these, 376 (44.44%) were men, while 470 (55.56%) were women. The participants ranged in age from 60 to 96 years. The overall mean age was 69.70 ± 7.66 years, with mean ages of 70.04 ± 7.96 years among male participants and 69.43 ± 7.40 years among female participants (Table 1).

The mean body mass index (BMI) of the study participants was 23.52 ± 4.02 kg/m². According to the Asian BMI classification:

- 66 (7.80%) were underweight,
- 370 (43.74%) had normal BMI,
- 152 (17.97%) were overweight at risk,
- 188 (22.22%) belonged to the obese I category, and
- 70 (8.27%) were categorized as obese II.

Functional assessment using the Katz Index of Basic Activities of Daily Living (BADL) demonstrated that 754 participants (89.13%; 95% CI: 85.76%–91.93%) were independent in performing basic daily activities (Table 2).
Assessment of Instrumental Activities of Daily Living (IADL) using the Lawton-Brody Scale revealed that 340 participants (40.19%; 95% CI: 35.48%–45.03%) were functionally independent in performing instrumental daily activities (Table 3).

A total of 164 participants (19.39%) had no documented comorbid medical conditions. In contrast, 368 participants (43.50%) had comorbidities, defined as the coexistence of two or more diseases in the same individual (Table 4).

TABLES

Table 1. Demographic characteristics of elderly patients (n = 846)

Demographic Variables	Category	Frequency, n (%)
Sex	Male	376 (44.44)
	Female	470 (55.56)
Age categories (years)	60–69	446 (52.72)
	70–79	298 (35.22)
	≥80	102 (12.06)
Religion	Atheist	2 (0.24)
	Buddhist	40 (4.73)
	Christian	10 (1.18)
	Hindu	792 (93.62)
	Muslim	2 (0.24)
Education level	Illiterate	654 (77.30)
	Primary level	126 (14.89)
	Secondary level	36 (4.26)
	Bachelor's	2 (0.24)
	Master's	20 (2.36)
	Post Doctorate	8 (0.95)
Marital status	Married	780 (92.20)
	Unmarried	4 (0.47)
	Divorced	2 (0.24)
	Widowed	60 (7.09)
Living arrangement	Alone	48 (5.67)
	With family	798 (94.33)

Table 2. Katz scoring for BADL in elderly patients (n = 846)

Functional status	Frequency n (%)
Independent	754 (89.13)
Dependent	92 (10.87)
If dependent (n = 92)	
Very severe dependence	8 (8.70)
Severe dependence	20 (21.74)
Moderate dependence	64 (69.57)
Total	**846 (100.00)**

Table 3. Lawton Scoring for IADL in elderly patients (n = 846)

IADL Functional Status	Frequency n (%)
Independent	340 (40.19)
Dependent	506 (59.81)
Total	**846 (100.00)**

Table 4. Distribution of comorbidities among elderly patients (n = 846)
4a. According to the presence and absence of morbidities

Morbidities	Frequency, n (%)
One	314 (37.12)
Two or more than two (Comorbidity)	368 (43.50)
None	164 (19.39)
Total	**846 (100.00)**

4b. According to the distribution of individual diseases

Comorbidities	Frequency, n (%)
Hypertension (HTN)	394 (46.57)
Diabetes Mellitus (DM)	196 (23.17)
Chronic Obstructive Pulmonary Disease (COPD)	162 (19.15)
Dyslipidemia	118 (13.95)
Thyroid disorder	92 (10.87)
Arthritis	84 (9.93)
Acid Peptic Disease (APD)	80 (9.46)
Benign Prostatic Hyperplasia (BPH)	50 (5.91)
Heart Failure	28 (3.31)
Chronic Liver Disease (CLD)	22 (2.60)
Dementia	16 (1.89)
Depression	10 (1.18)
Stroke	8 (0.95)
Parkinsonism	6 (0.71)
Chronic Kidney Disease (CKD)	4 (0.47)

DISCUSSION

In the present study, the mean age of the participants was 69.70 ± 7.66 years. Most of the study population (94.33%) resided with their family members. This observation is likely attributable to the prevailing cultural and social structure in India, where older adults traditionally live with their children or extended families and receive familial support during old age.

Assessment of Basic Activities of Daily Living (BADL) using the Katz Index demonstrated that 754 participants (89.13%) were functionally independent. Comparable findings have been reported by Sundaram R et al.[9] However, this proportion was considerably higher than the 45.00% independence reported by Shrestha KD et al.[10] The discrepancy may be explained by differences in the study settings. While the present study enrolled ambulatory patients attending the outpatient department, the latter included hospitalized patients, who are generally more likely to have acute illnesses or greater functional impairment requiring assistance with routine daily activities.

Evaluation of Instrumental Activities of Daily Living (IADL) using the Lawton-Brody Scale showed that 506 participants (59.81**%)** of participants were dependent in performing instrumental daily activities. This relatively high level of dependency may be related to the nature of the Lawton scale itself, which assesses eight complex activities requiring cognitive, social, and functional competence, including financial management and medication handling.

The prevalence of comorbidities in the present study was 368 participants (43.50%), which is notably higher than the 22.80% as reported[7] This difference may be explained by better accessibility to healthcare services among the study

population, as a large proportion of participants belonged to urban areas and lived with their families. Improved healthcare access and family support may facilitate earlier medical consultation, timely diagnosis, and documentation of chronic diseases, thereby increasing the reported prevalence of comorbid conditions.

Among all chronic illnesses, hypertension was the most frequently observed condition, affecting 394 participants (46.57%). This prevalence was lower than the report in which 60% of the elderly population had hypertension.[4] In addition, hypertension was particularly common among individuals aged over 80 years, with 72 participants (70.59%) in this age group being hypertensive. Similar age-related trends have been documented in previous studies.[7, 11]

Overall, 368 participants (43.50%) were found to have two or more chronic medical conditions, reflecting a considerable burden of multimorbidity among the elderly. Comparable observations have been described in several previous investigations.[12-15] A systematic review by Soley-Bori et al. concluded that multimorbidity is associated with increased healthcare utilization and substantially higher healthcare expenditure, thereby placing additional financial strain on healthcare systems.[16] These findings are further supported by studies evaluating healthcare utilization and costs among older adults with multiple chronic diseases, which have consistently demonstrated disproportionate resource consumption and greater economic burden in this population.[17]

The present study has certain limitations. Since it was conducted in an Urban health centre, the findings may not accurately represent the health status of the general elderly population across India. In addition, participants were not categorized according to specific combinations of comorbid conditions. The study documented only the presence or absence of individual diseases and did not evaluate the patterns of coexistence among different comorbidities. Future studies involving larger and more representative populations should include detailed analyses of multimorbidity patterns to provide a more comprehensive understanding of disease clustering and its impact on functional status among older adults.

CONCLUSION

The findings of the present study indicate that the majority of geriatric patients attending the outpatient department were functionally independent in **Basic Activities of Daily Living (BADL)** as assessed by the **Katz Index of Independence.** In contrast, approximately two-fifths of the participants were independent in **Instrumental Activities of Daily Living (IADL)** according to the **Lawton-Brody Scale.** Hypertension emerged as the most prevalent chronic medical condition among the study population, and nearly half of the participants had two or more comorbidities.

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