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PREVALENCE OF COGNITIVE IMPAIRMENT AND DEPRESSION AMONG ELDERLY ATTENDING A TERTIARY HEALTH CARE HOSPITAL

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ABSTRACT

Background: Population ageing is a global phenomenon and is associated with an increased burden of chronic diseases and mental health disorders. Cognitive impairment and depression are common psychiatric conditions affecting the elderly and usually coexist, causing significant morbidity, functional decline, and reduced quality of life. Hospital-based data on the prevalence of these conditions among elderly patients in India remain limited.
Objectives: To determine the prevalence of cognitive impairment and depression among elderly patients attending a tertiary health care hospital and to assess their association with sociodemographic variables and comorbidities.
Materials and Methods: Hospital-based cross-sectional observational study was done among 100 elderly patients aged 60 years and above attending the outpatient and inpatient departments of General Medicine at a tertiary care hospital. Data were collected using a structured questionnaire. Cognitive impairment was assessed using the Mini-Mental State Examination (MMSE). Score <24 indicates cognitive impairment. Depression was assessed using the 15-item Geriatric Depression Scale (GDS). Score ≥5 suggests depression.
Results: The prevalence of cognitive impairment was 38%. Depression was present in 44% of the study participants. Cognitive impairment was significantly more among patients aged 70 years and above. Depression was more prevalent among females. There is a statistically significant association between cognitive impairment and depression. Chronic comorbidities like hypertension and diabetes mellitus were commonly observed among participants.
Conclusion: The study showed high prevalence of cognitive impairment and depression among elderly patients attending a tertiary care hospital. Routine screening and early intervention using simple assessment tools are essential to improve geriatric mental health outcomes.

Keywords*: Cognitive impairment; Depression; Elderly; Geriatric mental health; Tertiary care hospital; Mini-Mental State Examination; Geriatric Depression Scale.*

INTRODUCTION

The global demographic transition toward an ageing population is one of the most significant public health challenges of the 21st century. Improvements in healthcare and living standards increased the number of older adults (≥60 years) rapidly, especially in developing countries like India. This demographic shift is accompanied by increasing burden of chronic diseases, disabilities, and mental health disorders in the elderly. They may adversely impact quality of life, functional independence, and health service utilization. Among the most common and disabling geriatric mental health conditions are cognitive impairment and depression, both of which frequently coexist and compound overall morbidity.

Cognitive impairment is the deterioration in memory, executive function, attention, language, or visuospatial abilities that exceeds what would be expected from normal ageing. This spectrum ranges from mild cognitive impairment (MCI) to

dementia, with significant implications for daily functioning, healthcare costs, and caregiver burden. Depression in late life is also prevalent and usually underdiagnosed due to atypical presentations, overlap with somatic symptoms, and misattribution to ageing itself. Beyond psychological distress, depression is associated with worse outcomes in chronic diseases, increased mortality, impaired social functioning, and higher risk of suicide. [1]

Epidemiological studies suggest that cognitive impairment and depression frequently co-occur in elderly populations, with estimates of co-prevalence varying by setting, assessment tools, and socioeconomic factors.[2-3] Community-based research has documented that 20–50% of older adults with late-life depression showed cognitive deficits and that depression may act both as a risk factor and early manifestation of cognitive decline.[4,5] Nationally representative data from India found that major depression and cognitive impairment affect a significant proportion of older adults, with depression increasing the odds of cognitive impairment and rural residence further elevating risk.

Hospital-based studies in tertiary care settings provide information on clinical burden among elderly patients who already seek medical attention for varied health issues. One community-based study conducted among elderly patients in India reported a prevalence of cognitive impairment of 25.5% and depression of 21.9%.[6] Another study from North India assessing geriatric patients found cognitive impairment in 35.7% and depression in 45.45%.[7] These prevalence figures are more due to increased comorbidity, complex medical conditions, and heightened psychosocial stressors that drive tertiary health care utilization.

Many factors contribute to the high prevalence of cognitive impairment and depression in elderly hospital attendees. Age-related neurobiological changes, chronic medical illnesses (like diabetes, cardiovascular disease, and hypertension), polypharmacy, sensory deficits, social isolation, bereavement, and low educational attainment are all recognized risk determinants.[8,9] Depression in the elderly is frequently under-recognized due to somatic symptom masking, lack of routine screening, and stigma associated with mental illness, leading to delayed diagnosis and treatment.

Understanding the prevalence and correlates of cognitive impairment and depression in a hospital setting is crucial for early detection, appropriate referral, and integrated management. Routine screening using validated tools such as the Mini-Mental State Examination (MMSE) and Geriatric Depression Scale (GDS) can facilitate early intervention, improve functional outcomes, and reduce long-term healthcare burden. Due to rising elderly population in India and worldwide, advancing geriatric mental health care in tertiary health institutions remains an urgent priority.

Aim and Objectives:
Aim: To determine the prevalence of cognitive impairment and depression among elderly patients.
Objectives: To assess association of cognitive impairment and depression with sociodemographic variables and comorbidities.

PATIENTS AND METHODS

Study Design
This was a hospital-based cross-sectional observational study done to assess the prevalence of cognitive impairment and depression among elderly subjects attending a tertiary health care hospital.

Study Setting
The study was carried out in the Outpatient and Inpatient Departments of General Medicine at a tertiary health care teaching hospital. Elderly patients attending the hospital for various medical complaints during the study period were recruited.

Study Duration
The study was conducted over a period of 7 months: December 2024 to June 2025

Study Population
Elderly patients aged 60 years and above attending the tertiary care hospital during the study period constituted the study population.

Sample Size
The sample size was calculated based on the prevalence of cognitive impairment and depression among the elderly from previous study[10] with a confidence level of 95% and an allowable error of 9%. Prevalence=25%
Formula used is: $n = Z^2pq/d^2$
As per the calculation, the minimum sample size came to be 93. So we included 100 subjects in this study.

Inclusion Criteria
- Patients aged ≥60 years
- Males and females
- Patients willing to participate and providing written informed consent
- Patients who were clinically stable and able to respond to interview questions

Exclusion Criteria

- Patients with severe hearing or visual impairment interfering with assessment
- Patients with acute confusional state (delirium)
- Patients with previously diagnosed major psychiatric illness such as schizophrenia or bipolar disorder
- Patients with severe illness or terminal conditions preventing participation

Study Tools and Instruments

Data were collected using a pre-designed and pre-tested structured questionnaire, which included:

1. **Sociodemographic and Clinical Profile**
   Age, gender, education, marital status, socioeconomic status, comorbidities
2. **Assessment of Cognitive Impairment**
   Cognitive function was assessed using the Mini-Mental State Examination (MMSE). A score of <24 was considered indicative of cognitive impairment.
3. **Assessment of Depression**
   Depression was assessed using the Geriatric Depression Scale (GDS – 15 item version). A score of ≥5 was taken as suggestive of depression.

Data Collection Procedure: Eligible participants were identified and recruited after obtaining informed consent. Interviews were conducted in a quiet environment, ensuring privacy. The MMSE and GDS were administered in the participant's preferred language. Each interview lasted for around 15–20 minutes.

Ethical Considerations: Written informed consent was obtained from all participants. Confidentiality and anonymity were maintained throughout the study.

Statistical Analysis: Data were entered into Microsoft Excel and analyzed using Statistical Package for Social Sciences (SPSS) version 17.0. Categorical variables were expressed as frequencies and percentages. Prevalence of cognitive impairment and depression was calculated. Association between cognitive impairment, depression, and sociodemographic variables was assessed using the Chi-square test. p-value of <0.05 was considered statistically significant.

RESULTS

Age and Gender: 52% of the patients were aged 60-69 years, 33% were aged 70-79 years. 15% were aged above 80 years. 54% of the patients were female.

Educational Status: 38% of the patients were illiterate. 32% had completed primary school, 20% had completed secondary school, 10% had completed graduate and above studies.

Prevalence of Cognitive Impairment (MMSE): 62% of the patients had normal cognition, as per MMSE score.

Table 1: Prevalence of cognitive impairment

Cognitive status	**Frequency**	**Percentage**
Normal cognition	62	62.0
Cognitive impairment	38	38.0
Total	100	100.0

Prevalence of Depression (GDS): 44% of the patients had depression.

Severity of Depression Based on GDS: 22 had mild severity of depression based on GDS score. 15 had moderate depression and 7 had severe depression among 44 patients with depression in the current study. GDS short form was used. 0 to 4: Normal score, 5 to 8: Mild depression, 9 to 11 is moderate depression and 12-15 is severe depression.

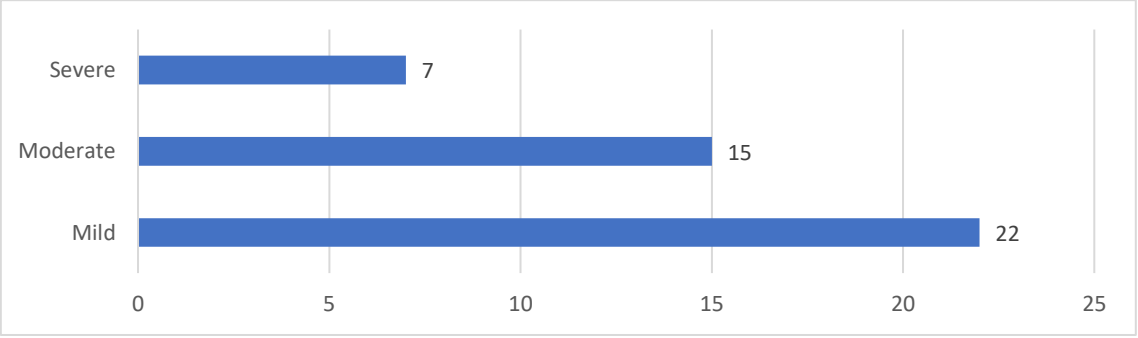

Figure 1: Severity of depression

Association between Age Group, gender and Cognitive Impairment and depression:
There is significant association between age group and cognitve impairment. There is significant association between gender and presence of depression. Females had more incidence of depression.

Variable	Category	Cognitive Impairment Present n (%)	Cognitive Impairment Absent n (%)	Depression Present n (%)	Depression Absent n (%)
Age group (years)	60–69 (n = 52)	10 (19.2)	42 (80.8)	18 (34.6)	34 (65.4)
	70–79 (n = 33)	16 (48.5)	17 (51.5)	16 (48.5)	17 (51.5)
	≥80 (n = 15)	12 (80.0)	3 (20.0)	10 (66.7)	5 (33.3)
Gender	Male (n = 46)	14 (30.4)	32 (69.6)	16 (34.8)	30 (65.2)
	Female (n = 54)	24 (44.4)	30 (55.6)	28 (51.9)	26 (48.1)

Table 2: Association of age and gender with cognitive impairment and depression
Age vs Cognitive impairment: $\chi^2 = 19.84$, df = 2, $p < 0.001$
Age vs Depression: $\chi^2 = 8.21$, df = 2, $p = 0.016$
Gender vs Cognitive impairment: $\chi^2 = 2.12$, df = 1, $p = 0.145$
Gender vs Depression: $\chi^2 = 4.67$, df = 1, $p = 0.031$

Association between Cognitive Impairment and Depression:
There is significant association between cognitive impairment and presence of depresssion.

Table 3: Association of cognitive impairment with depression

Cognitive Impairment	Depression Present n (%)	Depression Absent n (%)	Total
Present (n = 38)	28 (73.7)	10 (26.3)	38
Absent (n = 62)	16 (25.8)	46 (74.2)	62
Total	44	56	**100**
Chi-square (χ^2)	21.87		
Degrees of freedom (df)	1		
p-value	<0.001*		

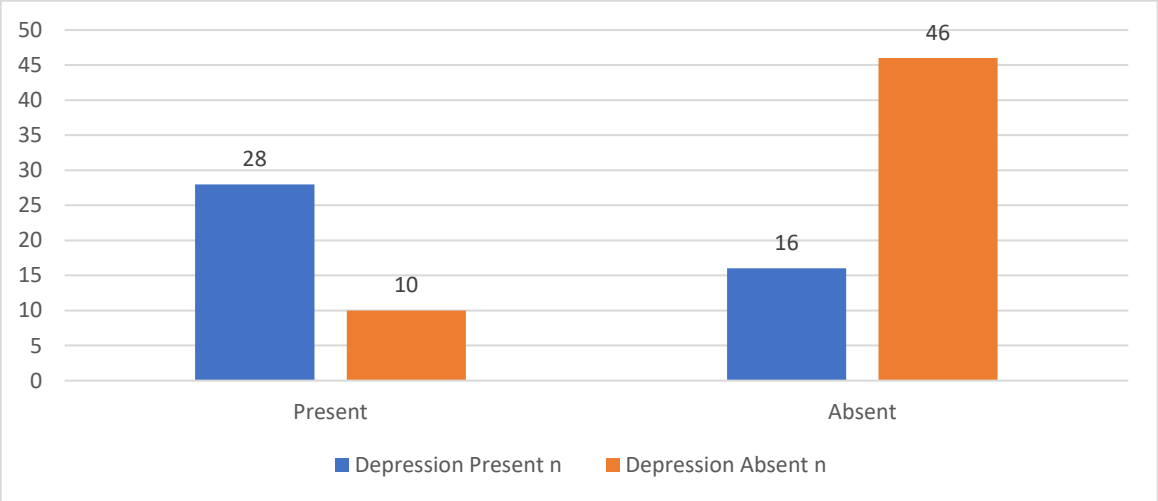

Figure 2: Association of cognitive impairment with depression

Distribution of Comorbidities: 28% had hypertension alone, 22% had diabetes alone, 30% had none, 20% had other comorbidities.

Association of comorbidities with depression and cognitive impairment:
There is significant association between comorbidities presence, type with presence of depression and cognitive impairment.

Table 4: Association of comorbidities with cognitive impairment and depression

Comorbidity Type	Cognitive Impairment Present n (%)	Cognitive Impairment Absent n (%)	Depression Present n (%)	Depression Absent n (%)	Total
Hypertension alone	14 (50.0)	14 (50.0)	16 (57.1)	12 (42.9)	28
Diabetes mellitus alone	10 (45.5)	12 (54.5)	12 (54.5)	10 (45.5)	22
Other comorbidities	8 (40.0)	12 (60.0)	10 (50.0)	10 (50.0)	20
None	6 (20.0)	24 (80.0)	6 (20.0)	24 (80.0)	30
Total	**38**	**62**	**44**	**56**	**100**

Outcome	χ^2 value	df	p-value
Cognitive impairment vs comorbidities	**9.84**	3	**0.020***
Depression vs comorbidities	**10.72**	3	**0.013***

DISCUSSION

The present hospital-based cross-sectional study assessed the prevalence of cognitive impairment and depression among elderly patients attending a tertiary health care hospital. In the present study, the prevalence of cognitive impairment was found to be 38%, which is comparable to findings from other hospital-based studies conducted in India. Ranjan et al. reported a prevalence of cognitive impairment of 35.7% among elderly patients attending a tertiary care hospital. This informs more burden of cognitive disorders in clinical settings. More prevalence in hospital-based studies compared to community-based studies may be attributed to increased comorbid illnesses, polypharmacy, and referral bias associated with tertiary care hospitals.[11]

The prevalence of depression in the present study was 44%. This is similar with previous Indian studies reporting rates ranging from 40% to 50% among elderly hospital attendees.[12] Kumar et al. Found more prevalence of depression among elderly patients attending a tertiary care hospital and emphasized that depression in late life is commonly underdiagnosed due to overlapping somatic symptoms and misconceptions that depressive symptoms are a normal part of ageing.[13]

There is a significant association between advancing age and cognitive impairment, with elderly individuals aged 70 years and above being more affected. Age was been identified as a strong risk factor for cognitive decline due to progressive neurodegenerative changes and cumulative vascular insults.

In the present study, depression was more prevalent among females than males. This finding is consistent with existing literature, which suggests that elderly women are at higher risk of depression due to factors like longer life expectancy, widowhood, social isolation, and economic dependence. Gender differences in the prevalence of depression among the elderly have been well documented across different populations. An important finding of this study was the strong association between cognitive impairment and depression. More proportion of elderly individuals with cognitive impairment also had depressive symptoms. This observation is supported by previous studies indicating that depression and cognitive impairment frequently coexist in late life.[4] Depression act as risk factor and an early manifestation of cognitive decline and dementia. The coexistence of these conditions worsens functional status and increases caregiver burden. The presence of chronic medical comorbidities like hypertension and diabetes mellitus was common among the study participants. These conditions are known to contribute to cognitive impairment and depression through vascular mechanisms, chronic inflammation, and psychosocial stress. The findings prove the need for holistic approach to elderly care, addressing physical and mental health aspects. Overall, the study shows the importance of routine screening for cognitive impairment and depression among elderly patients attending tertiary care hospitals. Early identification using simple screening tools such as the MMSE and GDS can facilitate timely intervention, improve functional outcomes, and enhance quality of life in this vulnerable population.

CONCLUSION

The present study showed high prevalence of cognitive impairment and depression among elderly patients attending a tertiary health care hospital. More than one-third of the study population had cognitive impairment, and nearly half of the elderly participants were found to be suffering from depression. Early identification and integrated management of cognitive impairment and depression can improve clinical outcomes, reduce disability, and enhance overall quality of life among the elderly population.

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