Research Article

Correlation Between Depression And Cognitive Impairment Among Elderly In South India

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ARTICLE INFO	ABSTRACT
	Background: Depression and cognitive impairment often coexist in older adults. The relation between depression and cognitive impairment is complex. Patients with depressive disorder often report forgetfulness along with typical symptoms of depression. **Aim:** To find out the relationship between depression and Cognitive Impairment among Elderly. **Methodology**: A correlational study was conducted in five selected old age homes in Chennai. Ethical approval was obtained from the Institutional Ethics Review Board. Formal permission was obtained from the Incharge of old age home, Chengalpet District. Prior to data collection written informed consent obtained from the elderly. A total of 252 elderly were screened for cognitive impairment using Montreal Cognitive Assessment tool and depression by using Geriatric Depression scale. **Results:** 87% (220) of elderly had cognitive impairment in which 16.8% had mild CI, 62.2% had moderate CI and 21% had severe CI. 27(12.2%), 147(66.8%), 46(21%) of elderly had mild, moderate and severe depression. Results also revealed that there is a weak positive correlation between depression and cognitive impairment. **Conclusion:** Elderly with cognitive impairment and depression has to be identified at the earliest and providing prompt interventions will prevent future psychiatric illnesses. **Key words:** Depression, cognitive impairment, elderly

Introduction

Cognitive impairment (CI) is emerging as an important health problem of the elderly population in India. Cognitive impairment (CI) is when a person has trouble remembering, learning, concentrating, or making decisions that affect their daily life. The Dementia India Report estimated that 3.7 million people were affected by dementia in the year 2010 and this graph will continue to rise with time. The main concern is to avoid a situation where diseases like CI limit the life of an elderly. Much more in-home care and unpaid assistance by family will be needed in the future. (Khanna AB, Metgud CS, 2020)

A population-based cross-sectional survey was conducted among residents from three villages and six urban communities in the county-level city of Liuyang in southern China (*N* = 3233). A total of 2598 participants were selected after filtering out those under 60 years old or with incomplete data. Results revealed that the prevalence of cognitive impairment, MCI, and dementia among participants aged 60 years and older were 21.48% (95% CI, 19.90−23.10), 15.70% (95% CI, 14.30−17.10), and 5.77 (95% CI, 4.90−6.70), respectively. And residents in villagers were more likely to have cognitive impairment than in urban communities (*p* < 0.001). Age growth and education level were independent influencing factors for cognitive impairment in all populations (*p* < 0.001). For lifestyles factors, both smoking and drinking reduced the risk of cognitive impairment (*p* < 0.05), but when further quantified, the link disappeared. (Xu T, Bu G, Yuan L, Zhou L, Yang Q et al, 2024)

A cross-sectional descriptive study was conducted among 135 older adults visiting a selected tertiary care centre in Uttarakhand (India) during December 2020, recruited using total enumerative sampling. Data were

collected using standardized and validated tools that consisted of socio-demographic information and Hindi Mental Status Examination. The results with pooled analysis have shown that 30% of the older adults had mild cognitive impairment, 9% had moderate cognitive impairment, and 61% had normal cognition. The statistically significant predictors for cognitive impairment were age group 80 years [odds ratio (OR) = 36.21; 95% confidence interval (CI) = 6.23–210.59], Muslim religion (OR = 6.26; 95% CI = 1.12–34.93), and middle-class families (OR = 11.95; 95% CI = 1.84-77.78). (Panghal C, Belsiyal CX, Rawat VS, Dhar M, 2022)

Major depression in the elderly is often accompanied by cognitive impairment. Although estimates vary, studies have shown that combined depression and cognitive dysfunction is present in roughly 25 per cent of subjects. In addition, the number of community residents with both depressive symptoms and impaired cognition doubles every five years after the age of 70. (Morimoto SS, Alexopoulos GS, 2013)

Depression and cognitive impairment often coexist in older adults. The relation between depression and cognitive impairment is complex. Patients with depressive disorder often report forgetfulness along with typical symptoms of depression. This is particularly evident in late-life depression (LLD) when compared to depression in younger age group. Cognitive deficits could be the primary reason for consultation in LLD. It is often difficult to tell whether depression is implicated in cognitive deficits or the initial cognitive decline in a neurodegenerative condition leads to depression as a reaction to it. Longitudinal studies have reported depression as one of the important risk factors for dementia. Older adult patients with depressive symptoms and cognitive deficits pose various challenges to clinicians. (Mukku SSR, Dahale AB, Muniswamy NR, Muliyala KP, Sivakumar PT, Varghese M, 2021)

This study aimed to assess the relationship between depression and cognitive impairment among elderly in South India.

Methods

A correlational study was carried out at old age homes in South India, between July 2023 and January 2024. Ethical approval was obtained from the Institutional Ethics Review Board. Formal permission was obtained from the Incharge of old age homes Chengalpet District. Prior to data collection written informed consent obtained from the elderly. The content validity of the Montreal Cognitive Assessment tool (MoCA) and Geriatric Depression scale was obtained from research experts, and the reliability of the tool was checked by the split half method, and the score was 0.89 and 0.84. MoCA is a 30-point scale, with items that include 6 for orientation, 5 for memory, 6 for language, 6 for mental control/attention, 3 for visuospatial, and 4 for executive abilities (including clock hands). Minimum score is 0 and maximum score is 30. A scores of 26 and above is considered as normal. (Paez-Venegas N, Jordan-Estrada B, Chavarria-Avila E, Perez-Vazquez F, Gómez-Bañuelos E et al, 2019). Geriatric depression scale consists of 15 items (10 -positive and 5-negative items). Minimum score is 0 and maximum score is 15. Scores of 0-4 are considered normal, 5-8 indicate mild depression; 9-11 indicate moderate depression; and 12-15 indicate severe depression. (Sheikh JI, Yesavage JA. Geriatric Depression Scale, 1986)

The sample was recruited from five old age homes. A total of 252 elderly aged above 60 years of age were screened using Montreal cognitive assessment (MoCA test) which is a highly validated, reliable and freely accessible screening tool for early detection of mild cognitive impairment. Finally, 220 elderly were confirmed as the study samples based on their availability, willingness and incomplete questionnaire. Geriatric depression scale was used to assess the level of depression among elderly.

Statistical analysis: Statistical analysis was performed using the Statistical Package for Social Sciences Programme (SPSS) version 17.0. Descriptive statistics was used to describe the demographic variables. Chi square test was used to find the association between the level of depression, cognitive impairment and the demographic variables. Karl Pearson Correlation Coefficient was used to assess the relationship between depression and cognitive impairment.

Results

134(61%) of elderly were between the age of 66-70 years, 122(55.6%) were female, 67(30.4%) had non formal education, 102(46.4%) were unemployed, 122(55.4%) were married, 51(23.2%) were staying in old age home for the past 3 years, 45(20.4%) were visited by family members once in six months, 67(30.4%) were neglected by children, 167(76%) had history of co-morbid illness, 154(70%) had family history of dementia and 84(38.2%) were watching television during their leisure time.

87% (220) of elderly had cognitive impairment and the level of cognitive impairment was depicted in Figure 1 and level of depression was depicted in Figure 2. The correlation between depression and cognitive impairment

among elderly were depicted in Table 1. Association of selected demographic variables with cognitive impairment and depression were depicted in Table 2 and Table 3.
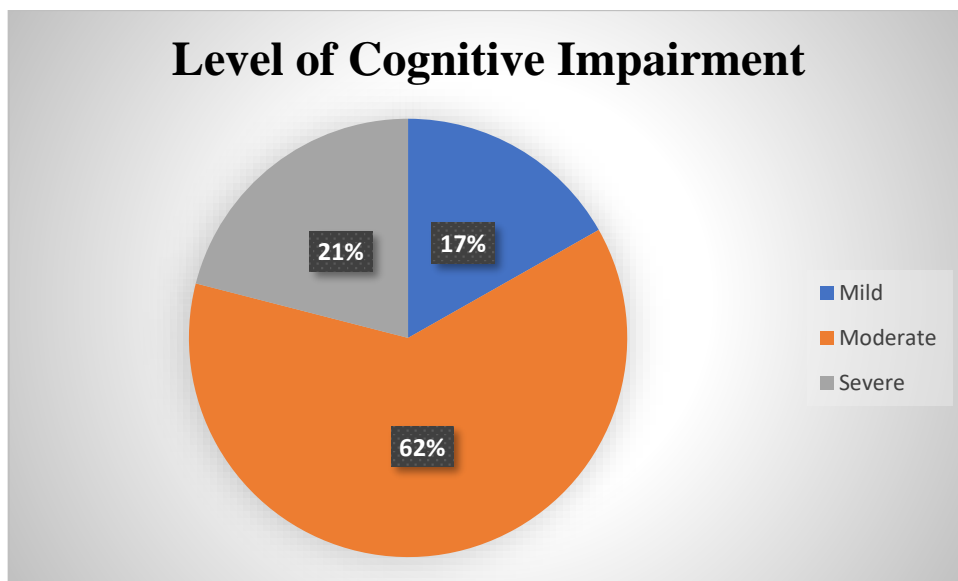

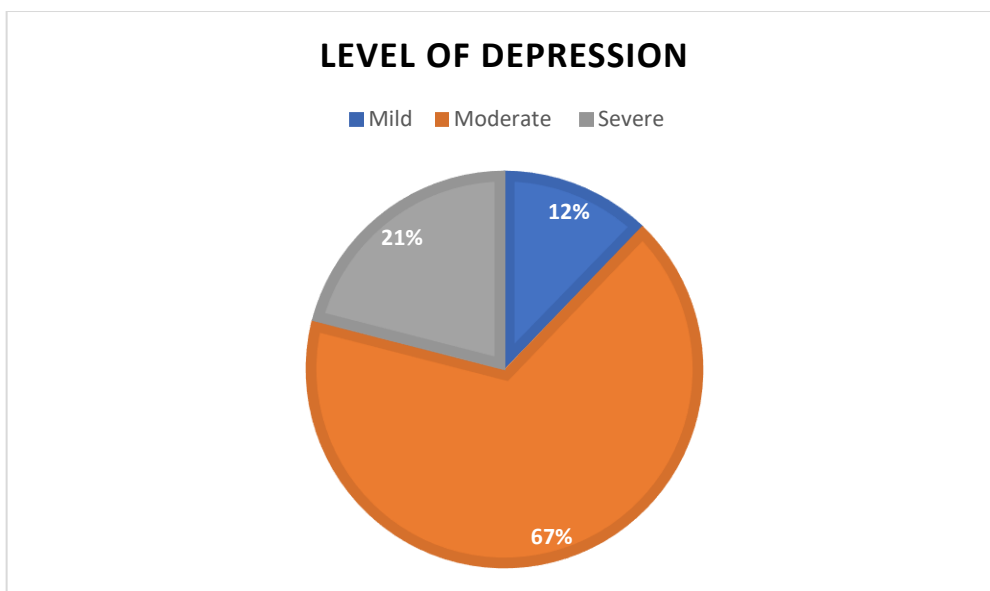**Figure 1: Level of cognitive impairment among elderly**

Figure 2: Level of depression among elderly

Table 1: Correlation between depression and Cognitive Impairment among elderly
N = 220

Variables	Mean Score	Standard Deviation	'r' value
Cognitive Impairment	13.5	4.66	0.0527 P = 0.4363
Depression	10.2	1.74	

Table 2: Association between level of cognitive impairment and demographic variables among elderly
N= 220

Demographic Characteristics		Cognitive Impairment			Chi SquareValue
		Mild	Moderate	Severe	
Marital status	Single/ unmarried	4	9	6	χ^2=23.944 df=8 p=0.0023 S
	Married	12	87	23	
	Widow/ widower	11	14	12	
	Separated	3	6	4	
	Divorced	7	21	1	
Reason to stay in old age home	Staying alone	4	29	12	χ^2=19.723 df=8 p=0.0114S
	Insisted by children	5	22	7	

	Neglected by children	9	47	11	
	Voluntarily	6	28	8	
	Others, specify	13	11	8	

Table 3: Association between level of depression and demographic variables among elderly N = 220

Demographic Characteristics		Depression			Chi SquareValue
		Mild	Moderate	Severe	
Gender	Male	8	54	36	χ²=27.229
	Female	19	93	10	df=2 p=0.0000 S
Marital status	Single/ unmarried	4	9	6	
	Married	10	97	15	χ²=23.244
	Widow/ widower	4	20	13	df=8 p=0.0030 S
	Separated	2	7	4	
	Divorced	7	14	8	
History of comorbid illness	Yes	13	123	31	χ²=18.049
	No	14	24	15	df=2 p=0.0001 S
Family History of dementia	Yes	14	111	29	χ²=7.42
	No	13	36	17	df=2 p=0.0244 S

Discussion

The study findings revealed that 220(87%) elderly had cognitive impairment and depression. Elderly who were female, married, had history of co-morbid illness and family history of dementia had moderate level of depression. The study findings were consistent with the study conducted by Mohan D, Iype T, Varghese S, Usha A, Mohan M, 2019 on prevalence and factors associated with mild cognitive impairment among older adults in an urban area of Kerala. The study participants were community-dwelling individuals aged 60 years and above. Data were also collected on socio demographic variables, self-reported co-morbidities like hypertension and diabetes, lifestyle factors, depression, anxiety and activities of daily living Results revealed that the prevalence of MCI (Mild cognitive impairment) was found to be 26.06% (95% CI of 22.12 to 30.43). History of imbalance on walking (adjusted OR 2.75; 95 % CI of 1.46 to 5.17), presence of depression (adjusted OR 2.17, 95 % CI of 1.21 to 3.89), anxiety (adjusted OR 2.22; 95 % CI of 1.21 to 4.05) and alcohol use (adjusted OR 1.99; 95 % CI of 1.02 to 3.86) were positively associated with MCI while leisure activities at home (adjusted OR 0.33; 95 % CI of 0.11 to 0.95) were negatively associated.

Another prospective study conducted by Dzierzewski JM, Potter GG, Jones RN, 2015 stated that involving late onset depression (LOD) patients ($n = 453$) found increasing age, lower education status, and chronicity of depression as risk factors for poor cognitive performance. Hashem AH, M N, Gomaa MA, Khalaf OO, 2017 studies report cognitive deficits in older adults with depression irrespective of age at onset and severity. The majority of the studies reported that cognitive deficits were more in late life depression (LLD) compared to those with early onset depression (EOD). A few studies that compared LLD with MCI and mild AD reported that the difference was more in terms of severity, with LLD patients having relatively milder cognitive deficits. The findings involved impairment in attention, working memory, and executive dysfunction and good recognition memory.

A retrospective study reported that the risk of dementia increased by 20% for mid-life depressive symptoms and 70% for late-life depressive symptoms. (Barnes DE, Yaffe K, Byers AL, McCormick M, Schaefer C, and Whitmer RA, 2012) Among the prospective studies, the Framingham study cohort is an important one, consisting of 949 participants assessed at baseline and after 17 years. At baseline, 13.2% of subjects had depressive symptoms. At follow-up, 21.6% of those with depression developed dementia compared to 16.6% of nondepressed individuals. (Saczynski JS, Beiser A, Seshadri S, Auerbach S, Wolf PA, and Au R., 2010)

Conclusion

The current study findings revealed that cognitive deficits often exist in LLD (Late life depression). Depression with coexisting cognitive impairment is a heterogeneous condition more often seen in older adults. LLD with cognitive deficits is at a higher risk of progression to dementia. Cognitive deficits during depression increase functional impairment in older adults. Evaluation requires a systematic and comprehensive approach. Communicating the diagnosis to the patient and their families helps to allay apprehension and unnecessary investigations. Elderly with cognitive impairment and depression has to be identified at the earliest and providing prompt interventions will prevent future psychiatric illnesses.

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