ORIGINAL ARTICLE

Depression and Cognitive Impairment among Community-dwelling Older adults in Southern India

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Abstract

Background: Depression and cognitive impairment are two psychosocial health problems significantly affecting the quality of life of older adults across the globe. This study aimed to estimate the prevalence of psychosocial morbidities among older adults in a rural community of coastal Karnataka, India, and to determine the socio-demographic correlates of these morbidities.

Methods: This cross-sectional study was conducted in rural and semi-urban Udupi taluka, in southern India. A total of 1,832 men and women aged ≥60 years were surveyed from 2015 to 2017 using a simple random method. Data was collected from the participants through an interviewer-administered pre-designed semi-structured questionnaire, Geriatric depression scale-Short version, and Everyday Abilities Scale India, and data were analyzed using SPSS version 26.0. Prevalence of depression and cognitive impairment among the study participants were reported, and significant sociodemographic predictors of these morbidities were determined using multivariate analysis.

Results: Prevalence of depression and cognitive impairment were 38.7% and 49.1%, respectively, among older adults. Low literacy, low socioeconomic status, and unemployment were significant predictors of depression, while only low literacy was found to be the predictor of cognitive impairment. Further, being employed in old age showed a protective effect on their cognitive health.

Conclusion: Psychosocial problems were highly prevalent among community-dwelling older adults. Improving their general health conditions, getting them involved in social activities tailored to their abilities and preferences, and ensuring economic independence through social security measures would pave the way in enhancing the mental health of older adults in southern India.

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Introduction

Aging is a global phenomenon and a normal, progressive, and irreversible process affecting every society. In this process, an individual's functional capacity weakens due to structural changes with the advancement of age.[1]

Old age is a transition period when one has to cope not only with physical aging but also with the challenges affecting mental and social well-being.[2] A large proportion of people with depression and cognitive disability live in lowor middle-income countries (60% in 2001, estimated to rise to 71% by 2040).[3]

According to India's Sample Registration Survey (SRS) in 2018, improved education, increased access

to healthcare facilities, and a rise in life expectancy have led to a significant increase in the proportion of the elderly population, from 6.0% in 1991 to 8.1% in 2019, thereby transforming India into a nation with a growing elderly demographic.[4] The growing elderly population in India is also affected by recent societal changes, such as the increasing number of nuclear families, the high cost of living, and family priorities. Further, dependency and decreased autonomy significantly affect the quality of life of older adults and disturb their mental health.[4] The prevalence of mental health illnesses among older adults in India ranges from 22.3% to 43.3%, while the lifetime prevalence of mental morbidity is 15.1% in this age group.[5]

Depression and cognitive impairments are two of the most common mental morbidities among older Indian adults. Depressive symptoms in older patients flag an increased likelihood of cognitive decline. This effect is considerable and may be due to several underlying mechanisms.[6] Cognition is the mental process of understanding, acquiring, and knowing information from the environment, which is necessary for daily living activities. Cognitive dysfunction is a major cause of illness in older individuals that affects 1 in 4 persons.[7] Age above 80 years, female gender, low literacy level, loss of income, recent bereavement, having other chronic illnesses, decreased autonomy, lack of family support and physical & financial dependence have been identified as significant predictors for these morbidities among the older adults.[8-10]

It is documented that most of the elderly in coastal Karnataka suffer from health problems, dependency, and a sense of neglect by their family members.[11] This reinforces an emerging need for interventions to promote the overall health and well-being of this region's older adults and create a policy to meet their requirements.

However, limited literature addresses the prevalence and predictors of the most common mental illnesses among the elderly from this region. Hence, this cross-sectional survey was undertaken among community-dwelling older adults in coastal Karnataka, India.

Based on the previous literature, we hypothesized that 1) Depression and cognitive problems are prevalent among community-dwelling older adults in coastal Karnataka and 2) there is an association between these psychosocial morbidities and sociodemographic characteristics of the older adults.

Methods

Study Design and Participants

This population-based cross-sectional study was part of a larger survey among the geriatric population in the field practice area of a medical college in southern India. The area has a comparatively higher literacy rate (86.24%) and a favorable sex ratio (1094 females per 1000 males). Most of the families are Hindu (86%) by religion, followed by Muslim (8%) and Christian (7%). The matriarchal system prevails in some of the communities in this region.[12]

It was carried out between 2015 and 2017 among men and women aged 60 years and above who were permanent residents of the rural and semi-urban localities in the study area. Individuals who were severely ill or bedridden were excluded from the study. The Institutional Ethics Committee has approved the study protocol before initiation of the study. (Registration no: ECR/146/Inst/KA/2013; Project Approval no.:255/2011).

Considering the prevalence of dementia as 3% at a 95% confidence level with a relative precision of 30% and a non-response rate of 30%, the sample size was estimated to be 1868.[13] The survey team included a trained medico-social worker (MSW) and a nurse. During the house visits, each older adult was informed about the purpose of the house visit in vernacular language and was included in the study after obtaining written informed consent, assuring anonymity and confidentiality of their information. The study area's population is spread across 14 villages, with the average number of older adults per village being around 500. Hence, four villages were selected by a simple random sampling method. The study team surveyed each village, starting from a prominent landmark and visiting the houses consecutively to the right. All the consenting older adults in each household were included until the required sample size was achieved.

Instruments

During the household visits, the trained MSW documented the sociodemographic characteristics of older people using a pre-designed questionnaire in all four villages through the interview method. The family's socioeconomic status was assessed using the modified Udai Pareek's scale.[14] This scale is a well-accepted measure to calculate the SES of a family in rural areas. It consists of nine items—caste, occupation and education of the head of the family (HOF), HOF's social participation level, landholding, type of housing, farm power (animals), material possession, and type of family and the total scores are classified into five categories.

Geriatric Depression Scale (GDS) Shorter version - a 15-item instrument, was used by the MSW to assess the depression status of the surveyed older adults.[15] They were categorized as having no depression if the score was <5, mild depression for a score of 5 to 9, and moderate to severe depression if the score was ≥10.

Everyday Ability Scale of India (EASI) - a 12-item

questionnaire, a screening tool that determines the presence of dementia among older adults dwelling in rural areas of India, was used to assess the cognitive functional ability of the participants.[16] EASI has been validated to be an alternative tool to Mental State Examination in screening for dementia among rural and illiterate older adults, and this tool can be used even among informants of older adults who are cognitively unstable.[17] This questionnaire was administered to a reliable adult household member, who was asked whether or not older people had difficulty performing the listed activities. With the scores ranging between 0 and 12, an elderly was considered to have no cognitive impairment if the score was zero, mild impairment if the scores ranged between 1 and 6, and severe impairment when their scores were >6.

Statistical Analysis

Data were analyzed using Statistical Package for Social Sciences (SPSS) version 26.0. Results have been expressed as frequencies and proportions. The association of depression and cognitive impairment with each other and with various sociodemographic characteristics of the participants were determined using a binary logistic regression model, and the results were expressed as odds ratio (OR) with 95% confidence intervals (CI). The variables showing associations with the morbidities at P<0.2 were further included in forward stepwise multivariable logistic regression models. A P-value<0.05 was considered statistically significant.

Results

The survey was conducted across semi-urban and rural areas, covering 1832 elderly individuals. As shown in Table 1, of the 1832 respondents, 1076 (58.7%) were females, and a little over a quarter did not have formal education (27.0%). It was noted that 18% of the study population worked during the survey, though over three-fourths were engaged in unskilled or semiskilled work. Almost two-thirds (64.9%) of the participants were married, while 32.1% were widowed. About half of the respondents were from nuclear families (50.4%), and most (70.0%) of the respondents belonged to middle socioeconomic status.

Table 2 depicts the prevalence of depression and cognitive impairment among the geriatric population in the study area. The assessment of depression status using the GDS–Short version revealed that 595 (32.7%) had mild depression, 109 (6%) had severe depression, and the rest of them (61.3%) without depression. Nearly half of the participants (49.1%) had impaired cognitive function as per the EASI score, among whom the majority had mild impairment.

Table 1: Baseline characteristics of the study population (n=1832)

Characteristics		Frequency (%)
Age group (in years)	60-70	1322 (72.2)
	71-80	387 (21.1)
	81-90	107 (5.8)
	>90	16 (0.9)
Gender	Male	756 (41.3)
	Female	1076 (58.7)
Education	Illiterate	495 (27.0)
	Primary School	802 (43.8)
	High school	358 (19.5)
	College	177 (9.7)
Occupation	Working	337 (18.4)
	Not working	584 (31.9)
	Retired	241 (13.2)
	Housewife	670 (36.6)
Religion	Hindu	1534 (83.7)
	Muslim	161 (8.8)
	Christian	137 (7.5)
Marital status	Single	36 (2.0)
	Married	1190 (64.9)
	Divorced/ Separated	19 (1.0)
	Widowed	588 (32.1)
Type of family	Nuclear	923 (50.4)
	Joint	270 (14.7)
	Three generation	639 (34.9)
Socio-economic status *(n=1,812)	High	164 (9.1)
	Middle	1280 (70.6)
	Low	368 (20.3)

*Socio-economic status details were incomplete in the remaining forms

Table 2: Distribution of mental health morbidities among the study population

Morbidities	Status	Frequency (%)
Depression (as per GDS-Short Version score) [n=1,821]*	No depression (Score <5)	1117 (61.3)
	Mild depression (Score 5-9)	595 (32.7)
	Severe depression (Score 10-15)	109 (6.0)
Cognitive impairment (as per EASI score) [n=1,812]*	No impairment (Score 0)	912 (50.3)
	Mild cognitive impairment (Score 1-6)	860 (46.9%)
	Severe cognitive impairment (Score 7-12)	40 (2.2%)

*Details were incomplete in the remaining forms; Geriatric Depression Scale (GDS); Everyday Ability Scale of India (EASI)

Table 3: Association between depression and socio-demographic characteristics of the study population (n=1821)

Characteristic		Depression		Crude OR (95% CI)	Adjusted OR (95% CI)	P value
		Present No. (%)	Absent No. (%)			
Age group (in years)	60-70	451 (34.2)	867 (65.8)	1	-	-
	71-80	189 (49.2)	195 (50.8)	1.84 (1.46-2.32)		
	81-90	58 (54.7)	49 (45.3)	2.28 (1.53-3.40)		
	>90	05 (41.7)	07 (58.3)	0.88 (0.30-2.54)		
Gender	Male	283 (37.7)	467 (62.3)	1	-	-
	Female	421 (39.3)	650 (60.7)	2.16 (1.77-2.63)		
Years of schooling	>10	29 (16.4)	148 (83.6)	1	1	
	8-10	103 (28.8)	254 (71.1)	2.06 (1.30-3.26)	1.75 (1.07-2.84)	0.025
	1-7	332 (41.5)	468 (58.5)	3.60 (2.36-5.50)	2.88 (1.79-4.61)	<0.001
	Nil	240 (49.3)	247 (50.7)	4.80 (3.12-7.42)	3.36 (2.05-5.50)	<0.001
Occupation	Homemaker	276(41.5)	389 (58.5)	1	1	
	Working	79 (23.5)	257 (76.5)	0.44 (0.32-0.59)	0.37 (0.26-0.53)	<0.001
	Not working	295 (50.9)	284 (49.1)	1.46 (1.16-1.82)	1.13 (0.85-1.50)	0.393
	Retired	54 (22.4)	187 (77.6)	0.41 (0.29-0.58)	0.54 (0.36-0.83)	0.005
Socio economic status (n=1,812)	High	44 (26.8)	120 (73.2)	1	1	
	Middle	490 (38.3)	790 (61.7)	1.69 (1.17-2.43)	1.30 (0.88-1.93)	0.181
	Low	172 (46.7)	196 (53.3)	2.39 (1.60-3.57)	1.72 (1.11-2.67)	0.015
Religion	Hindu	621 (40.7)	904 (51.3)	2.14 (1.43-3.21)	-	-
	Muslim	50 (31.3)	110 (68.8)	1.42 (0.85-2.37)		
	Christian	33 (24.2)	103 (75.7)	1		

Statistically significant results have been presented in bold. confidence intervals (CI); odds ratio (OR)

Table 4: Association of cognitive impairment among older people with their socio-demographic parameters (n=1812)

Characteristic		Cognitive impairment		Crude OR (95% CI)	Adjusted OR (95% CI)	P value
		Present	Absent			
Age group (in years)	60-70	559 (42.7)	750 (57.3)	1	-	-
	71-80	244 (64.0)	137 (36.0)	2.39 (1.89-3.03)		
	81-90	82 (77.6)	26 (22.4)	4.64 (2.91-7.40) 17.44		
	>90	13 (92.9)	01 (7.1)	(2.27-133.7)		
Gender	Male	317 (42.4)	430 (57.6)	1	-	-
	Female	583 (54.8)	482 (45.3)	1.64 (1.36-1.98)		
Years of schooling	>10	45 (25.4)	132 (74.6)	1	1	
	8-10	124 (34.7)	233 (65.3)	1.56 (1.04-2.33)	1.37(0.88-2.12)	0.159
	1-7	429 (54.1)	365 (46.0)	3.45 (2.39-4.97)	3.07(2.01-4.69)	<0.001
	Nil	302 (62.4)	182 (37.6)	4.87 (3.31-7.15)	3.36 (2.14-5.29)	<0.001
Occupation	Homemaker	17 (2.6)	646 (97.4)	1		
	Working	01 (0.3)	334 (99.7)	0.41 (0.31-0.54)	0.57 (0.41-0.80)	0.001
	Not working	19 (3.3)	556 (96.7)	1.06 (0.85-1.33)	1.17 (0.88-1.57)	0.286
	Retired	03 (1.3)	236 (98.7)	0.38 (0.28-0.52)	0.72 (0.48-1.07)	0.106
Socio economic status	High	61(37.2)	103 62.8)	1	1	
	Middle	672 (52.5)	608 (47.4)	1.40 (0.96-2.05)	1.44 (0.99-2.09)	0.058
	Low	167 (45.3)	201 (54.6)	1.87 (1.33-2.61)	0.92 (0.60-1.41)	0.696
Religion	Hindu	790 (52.0)	728 (48.0)	1.75 (1.22-2.51)	-	-
	Muslim	58 (36.7)	100 (63.3)	0.94 (0.58-1.50)		
	Christian	52 (38.2)	84 (61.8)	1		

Statistically significant results have been presented in bold. Confidence intervals (CI); odds ratio (OR)

Table 5: Association between cognitive impairment and depression among older adults (n=1812)

Depression	Cognitive function		Crude OR (95% CI)	P value
	Impaired n (%)	Not impaired n (%)		
Present	452 (50.2)	252 (27.6)	2.64 (2.17-3.21)	<0.001
Absent	448 (49.8)	660 (72.4)	1	

Confidence intervals (CI)

Table 3 shows that the depression among the study participants was associated with factors such as higher age groups, females, lower literacy levels, unemployed currently with no pension, belonging to low or middle socioeconomic status, and Hindu religion on univariate analysis. Similarly, the risk of depression was significantly less among those working or currently getting post-retirement pensions. Multivariate analysis showed that low literacy levels and socioeconomic status were significant predictors of depression among older people. However, it was encouraging to note that having a job in old age or getting a regular pension had a protective effect.

Table 4 depicts the strength of the association between cognitive impairment and the sociodemographic variables among the study population. It was observed that elderly individuals aged >70 years, females, those with low literacy levels, and those from low socioeconomic status were associated with cognitive impairment while having a job and working or getting a pension in old age showed a protective effect on cognitive health among older people on univariate analysis. Further, multivariate analysis showed that only low literacy level (0-7 years of schooling) was a significant predictor of cognitive impairment, and working in old age was found to have a protective effect on their cognitive health.

Table 5 shows the association between cognitive impairment and depression among the study participants. A statistically significant association was observed between depression and cognitive impairment (OR=2.64; 95% CI: 2.17-3.21).

Discussion

Of the 1832 respondents surveyed in the present study, the majority (72.2%) were 60-70 years old, and 58.7% were females, similar to the findings reported by various studies across India (53.1%-56.2%).[18-20] About one-fourth of the study population (27%) had not had any schooling, which is lower compared to that reported by other studies from Tamil Nadu (62.8%), West Bengal (62.2%), and other part of Karnataka (62.9%).[21-23] This could be explained by the fact that the literacy rate is relatively higher in the study area compared to the northern parts of the state and the country. On the other hand, only 18% of the study population were working at the time of the survey, and 13.2% were getting pensions and hence were financially independent/partially dependent on their families compared to a higher proportion of elderly being independent in other parts of the country (40.6%-eastern India, 89.0%-West Bengal).[20, 22]

As per the published literature globally, many individuals experience depression later in life, which could lead to various morbidities and disabilities.[22, 24, 25] Commonly associated factors with depression include aging, female gender, low literacy level, poverty, poor health status, cognitive impairment, sleep pattern/disturbance, and living alone.[26-28] A previously published study from Uttar Pradesh has reported that the prevalence of psychiatric morbidity is much higher in the age group of 60 years and above (43.32%) than in the younger age group (4.66%).[29]

A sizable proportion (38.7%) of the study population had varying grades of depression, with a predominance of mild depression. This is in contrast to the findings of a study from West Bengal, wherein a higher prevalence (70.6%) of psychosocial morbidities was reported.[20] This could be due to the type of scale, i.e., General Health Questionnaire-28 (GHQ-28) used to assess the psycho-social morbidity in that study, contrary to the tool used in the present study. Similarly, a study from Kerala, a state in southern India, also reported a very high prevalence (72.4%) of depression among older people in their study population.[30] On the other hand, a study from the Uttarakhand state of India reported a lower prevalence (29.9%) of depression than the present study.[31] However, our finding agreed with many other Indian studies conducted in Tamil Nadu, Andhra Pradesh, Bihar, and Maharashtra (prevalence ranging from 39.6% to 47.0%).[21, 28, 32, 33]

In our study, illiteracy, poverty, and unemployment with no pension were significant predictors of depression in the geriatric population. Similar associations were reported in many previous studies conducted across India.[20, 28, 30] A study conducted in Bihar also reported a significant association between depression and factors such as age group, female gender, low literacy level, and financial dependency.[33] However, this study showed that upper socio-economic status is a risk factor for depression among older people. This contrasts our study finding and other prior studies wherein low socioeconomic status predicts depression among the elderly.[20, 28, 30] Low literacy and unemployment are the surrogate markers for poverty, and all these factors could lead to financial dependency and lack of decision-making power in the older adults making them more prone

for depression.

Our study revealed a higher prevalence of (49.1%) cognitive impairment as per the assessment based on EASI score compared to some of the previously published Indian studies such as those from Tamil Nadu (43.25%), Maharashtra (18.03%) and Malaysia. (22.4%).[21, 34, 35] Though a higher age group, female gender, having low literacy, and being from families with low socioeconomic status were associated with cognitive impairment among older people; only literacy level was determined as a significant predictor (P<0.001). Religion is also associated with cognitive impairment, though not on multivariate analysis. This could be explained by the fact that more than 80% of the study population were Hindu by religion. A study done in Malaysia found that age, gender, and literacy level were associated with impaired cognitive function among older people.[35] Likewise, reports of Indian studies conducted in Tamil Nadu and Maharashtra also revealed similar associations.[21, 34] Further, our findings showed that having a job in old age had an independent positive influence on their cognitive function (P<0.001), which could be mainly due to the financial independence they gained in addition to having a sense of self-worth and control they achieve by having an occupation in the old age.[36]

Our study also showed a significant association between cognitive impairment and depression among older adults. The Longitudinal Ageing Study in India (LASI) wave one report also described a similar association. This may be attributed to the increase in life expectancy, as older age is one of the most significant non-modifiable risk factors for cognitive impairment.[3]

To the best of the authors' knowledge, no population-based survey has been conducted in rural or semi-urban localities of this region to assess the prevalence of psycho-social morbidities among community-dwelling older adults.

Limitation

The tools used for this study are meant for screening purposes only, so the prevalence of depression and cognitive impairment may be over or underestimated. As this study was conducted in a limited population from a specific geographical area, the generalizability of the findings to urban areas and other regions may not be possible. Due to the study's cross-sectional nature, all the predictors of psycho-social morbidities among older adults would not have been ascertained in this region.

Conclusion

The present study done among the older adults in coastal Karnataka, India, shows that 38.7% of them had depression and 49.1% had cognitive impairment. Higher age groups, low literacy levels, unemployment in old age, and belonging to lower socioeconomic status were significantly associated with these morbidities. However, low literacy and socioeconomic status were observed to be the independent predictors of these conditions among older adults.

This baseline data on socio-demographic as well as psycho-social morbidities from the geriatric population of this area helps in further planning of the community-based interventions among the older adults and aligning with the United Nations Sustainable Development Goals (SDG) 3, 8 and 10.[37] Prioritizing the identification of diverse approaches to enhance psycho-social and cognitive health, along with evaluating the outcomes of such interventions, could be the path forward. Future research should also explore strategies aimed at improving social and vocational skills, enabling older individuals to maintain independence within their communities. As the prevalence of depression and cognitive impairment in the study area was higher, organizing periodic training programs for grassroots healthcare workers in early detection and referral of older adults with psycho-social morbidities at the community level is crucial. The National Program for Health Care of the Elderly implemented in 2011, needs to be strengthened further by carrying out studies identifying prevailing mental health issues and other morbidities among older adults in rural India.

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