

## Research Article

# Prevalence and factors associated with depression among the elderly in rural areas of Kannur, North Kerala, India: a cross sectional study

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## ABSTRACT

**Background:** The proportion of elderly people aged 60 years and above is increasing in India alarmingly and they are at higher risk of developing neuropsychiatric problems if any associated comorbidities exist. The commonest neuropsychiatric problem is depression and if not diagnosed and treated early will lead to serious psychiatric illnesses, so this study was conducted to know the prevalence and factors associated with geriatric depression in rural Kannur. The aim was to determine the prevalence and the factors associated with depression among elderly in rural areas of Kannur, North Kerala, India.

**Methods:** A cross sectional study was conducted at two Grama Panchayaths under the rural field practice area of Community Medicine department, Kannur Medical College, Kannur, Kerala, India. Convenient sampling method was used for the sampling. Data was collected using Geriatric Depression Scale (GDS) by visiting homes and rural health centre, descriptive statistics and associations were analysed.

**Results:** Out of 250 elderly persons, 51.6% were males and 48.4% were females and prevalence of geriatric depression was 72.4%. The independent predictors of depression were elderly persons aged >70 years, financial dependency and with one or more comorbidities ( $p < 0.05$ ).

**Conclusions:** The prevalence of geriatric depression is alarmingly high and the factors associated with geriatric depression were people aged >70 years, financial dependency and having one or more comorbidities. There is a need to strengthen the mental health programme in the primary health centres. Giving health education to family members to spend time with elderly, creating awareness about the availability of social security schemes, family support to the elderly may help in preventing depression.

**Keywords:** Depression, Geriatrics, Geriatric depression, Elderly people, North Kerala

## INTRODUCTION

The world's population getting aged rapidly and elderly persons, those who aged 60 or above estimated to double from about 12% to 22% between 2015 to 2050 (from 900 million to 2 billion people).<sup>1</sup> In India the population of elders is increasing alarmingly, they constitute about 8% of the total population and estimated to increase to 12.2% by 2026.<sup>2,3</sup> Most of the elderly will have good mental health, but many elderly persons are at a higher risk of

developing disorders of mental health, neurological disorders and substance use problems along with other health conditions-diabetes, hypertension, hearing loss, diminished vision and osteoarthritis. Furthermore, as people age, they may experience several conditions at the same time.<sup>1</sup>

One of the common neuropsychiatric disorders among elderly is depression and it constitutes a major public health problem worldwide.<sup>1</sup> The prevalence of geriatric depression ranges from 6% to 53% worldwide.<sup>4-10</sup> The

long standing and untreated minor depression among elderly will lead to serious neuropsychiatric disorders which will impair their quality of life.

The diagnosis of depression among elderly is difficult since they do not present with the classical symptoms of depression and also few studies showed that factors associated were to be multifactorial-comorbidities, loss of spouse or living alone, financial dependency, lack of family support and substance abuse etc.<sup>4,5,7-9,11</sup>

There are only few Indian studies on prevalence of geriatric depression and factors associated with it.<sup>5-9</sup> Kerala being the state with maximum number of elderly persons (12.6%), only one study in South Kerala was done, so this study was conducted with the objectives to determine the prevalence of geriatric depression and factors associated with it in rural Kannur, North Kerala, India.<sup>2,7</sup>

## METHODS

The cross sectional study was conducted in the two grama panchayaths (Vengad and Pinarayi) of rural field practice area of Department of Community Medicine, Kannur Medical College, Kannur, Kerala, India

### Study population

The people those who were aged 60 years and above in the two grama panchayaths of rural field practice area of Department of Community Medicine, Kannur Medical College were included in the study.

### Inclusion criteria

The people who were aged 60 years and above and those who were willing to participate were included in the study.

### Exclusion criteria

Elderly people those with any known neuropsychiatric problems, thyroid problems and previous history of depression within past 6 months were excluded.

The study was done for the 2 months (April - May 2016). The prevalence of geriatric depression in South Kerala community according to study conducted by Sandhya GI was 25.4% and this was taken for calculating sample size with the absolute precision at 6%, alpha 5% with design effect of 1, the sample size derived was 203 which was calculated using the Open Epi (Version 3.03). Considering the non-response rate at 25%, sample of 250 was collected.<sup>7</sup>

A convenient sampling method was used to collect data. The data was collected by visiting houses with the help of health workers and also from the elderly people visiting

the rural health centre for outpatient services or those who were accompanying a relative.

### Data collection tool

Data collection tool consists of two parts: Basic socio-demographic details (age, sex, education, marital status, financial dependency, history of co-morbidities etc) and geriatric depression scale (short form) of Sheikh & Yesavage which contains 15 questions about their feelings and have to choose best answer how they felt over the past one week.<sup>12,13</sup> For each question there will be scoring and scores have to be assigned based on the answers given. After that, total score has to be calculated and a score  $\geq 5$  suggests depression.

### Data collection

The study was conducted after taking ethical clearance from the institutional ethics committee, Kannur Medical College, Kannur, Kerala, India. After taking informed written consent from study participants the data was collected from those who were willing to participate in the study by interview method. Prior instructions were given to choose best answers how they felt over past one week.

### Data analysis

Data was entered in Epi Data entry V3.1 and descriptive statistics and chi square were analysed using EpiData Analysis V2.2.2.182, multiple logistic regression was used to check association between geriatric depression and significant factors using IBM SPSS Statistics V20 trial version. The p-value of  $<0.05$  was considered statistically significant.

## RESULTS

### Socio-demographic details

A total of 250 elderly persons were interviewed and the mean age of the study population was  $69.7 \pm 6.7$  years. There were about 51.6% (129) males and 48.4% (121) females participated in the study. Among the study population, about 54% (135) were married and 38.8% (97) were widows or widowers. About 46.4% (116) had primary level education and 22.8% (57) had studied up to high school.

In this study, 30.4% (76) of persons were doing manual labor and 23.6% (59) were unemployed. 47.6% were living with their spouses and 38% were financially dependent on children or others for their basic needs. Around 57% (143) of the people were not having any social security schemes and remaining had different schemes such as old age pension (17.2%), employment pension (14.8%), farmer's pension (7.4%) and widow pension (3.6). About 93% of the people were having one or other co-morbidities such as diabetes, hypertension, cardiovascular diseases, visual and hearing problems (Table 1).

**Table 1: Socio-demographic profile of the elderly persons of rural areas of Kannur, North Kerala, India based on the gender distribution during April-May 2016.**

Socio-demographic profile	Gender <sup>a</sup>		Total n (%)
	Male n (%)	Female n (%)	
<b>Age group</b>			
≤70 years	71 (55.0)	85 (70.2)	156 (62.4)
>70 years	58 (45.0)	36 (29.8)	94 (37.6)
<b>Marital status</b>			
Single	03 (02.3)	05 (04.1)	08 (03.2)
Married	83 (64.4)	52 (43.0)	135(54.0)
Divorced	0	02 (01.7)	02 (0.8)
Separated	04 (03.1)	04 (03.3)	08 (03.2)
Widow/widower	39(30.2)	58 (47.9)	97 (38.8)
<b>Education status</b>			
Illiterate	06 (04.7)	07 (05.8)	13 (05.2)
Primary school	49 (38.0)	67 (55.4)	116 (46.4)
High school	38 (29.5)	19 (15.7)	57 (22.8)
Higher secondary	05 (03.9)	03 (02.5)	08 (03.2)
Diploma	15(11.6)	15 (12.4)	30 (12.0)
Graduation	11 (08.5)	08 (06.6)	19 (07.6)
Post-graduation	05 (03.9)	02 (01.7)	07 (02.8)
<b>Presently living with</b>			
Spouse	72 (55.8)	47 (38.8)	119 (47.6)
Single	17 (13.2)	08 (06.6)	25 (10.0)
Children	40 (31.0)	66 (54.6)	106 (42.4)
<b>Financial status<sup>b</sup></b>			
Dependent	25 (19.4)	70 (57.9)	95 (38.0)
Partially dependent	38 (29.5)	35 (28.9)	73 (29.2)
Independent	66 (51.2)	73 (29.2)	82 (32.8)
<b>Co-morbid conditions</b>			
One or more comorbid conditions	118 (91.5)	113 (93.4)	231 (92.4)
No comorbid conditions	11 (08.5)	08 (06.6)	19 (7.6)
<b>Total</b>	<b>129</b>	<b>121</b>	<b>250</b>

<sup>a</sup> Read the percentages column wise for each group.

<sup>b</sup> Dependent- does not have any source of income and completely dependent on others for the all expenses (daily needs, medical expenses and others). Partially dependent- may have some source of income but is not enough to maintain the all the expenses and dependent on others for few expenses. Independent- Has a source of income and not dependent on others for any expenses.

### Geriatric depression

In this study, based on Geriatric Depression Scale (GDS), the prevalence of geriatric depression found was 72.4% (181). This high prevalence was found to be associated with many socio-demographic factors and coexistence of morbidities after doing univariate analysis (Table 2).

In the univariate analysis, females were found to be 1.78 times more likely to be depressed compared to males ( $p=0.04$ ). Elderly persons with more than 70 years had 3.8 times more chance of being depressed than persons aged less than 70 years ( $p < 0.001$ ) and persons with less than primary school education were found to be 2.32 times more depressed than persons having more than primary school education ( $p=0.004$ ). Geriatric depression was 6.2 times lesser with people who were married compared to people who were never married or divorced

or separated from spouse or widow or widower ( $p < 0.001$ ).

Depression was 5 times more in persons living single or with children (after the death of spouse) compared to persons living with spouse ( $p < 0.001$ ) and was 3.3 times more among the persons who were financially dependent on others compared with persons who were financially independent ( $p < 0.001$ ). Having one or more comorbidities increases the chance of depression by 4.2 times compared to having no comorbidities ( $p=0.003$ ).

The factors which were found to be significant for geriatric depression by univariate analysis (gender, age group, education, marital status, present living status, financial dependency and comorbidities) were subjected to multiple regression analysis to find the independent predictors of geriatric depression in subjects.

**Table 2: Univariate comparison of socio-demographic factors and co-morbidities with geriatric depression at rural areas of Kannur, North Kerala, India, during April-May 2016.**

Socio-demographic factors	Depression <sup>a</sup>		Odd's ratio (95% CI)	p-value
	Yes n=181 (%)	No n=69 (%)		
<b>Gender</b>				
Male	86 (67.2)	42 (32.8)	1	0.04
Female	95 (78.5)	27 (21.5)	1.78 (1.1-3.1)	
<b>Age group</b>				
≤70 years	100 (64.1)	56 (35.9)	1	<0.001
>70 years	81 (87.1)	13 (12.9)	3.8 (1.9-7.5)	
<b>Education</b>				
Less than primary school	104 (80.6)	25 (19.4)	2.32 (1.3-4.1)	0.004
Above primary school	77 (64.2)	44 (35.8)	1	
<b>Marital status</b>				
Married	78 (58.2)	56 (41.8)	1	<0.001
Single/divorced/separated/ widow/widower	103 (89.6)	13 (10.4)	6.2 (3.1-12.3)	
<b>Living with</b>				
Children/single	113 (86.9)	17 (13.1)	5 (2.6-9.3)	<0.001
Spouse	68 (57.1)	52 (42.9)	1	
<b>Financial status</b>				
Dependent	135 (80.8)	32 (19.2)	3.3 (1.8-5.9)	<0.001
Independent	46 (56.1)	37 (43.9)	1	
<b>Comorbidities</b>				
One or more comorbidities	173(75.2)	57 (24.8)	4.2(1.6-10.9)	0.003
No comorbidities	8 (42.1)	12 (57.9)	1	

<sup>a</sup> Read the percentages row wise for each group.**Table 3: Multiple logistic regression analysis showing socio-demographic factors and co-morbidities associated with geriatric depression at rural areas of Kannur, North Kerala, India, during April-May 2016.**

Socio-demographic factors	Odd's ratio (95% CI)	p value
<b>Gender</b>		
Male	1	0.89
Female	1.05 (0.49-2.23)	
<b>Age group</b>		
≤70 years	1	0.04
>70 years	2.23 (1.01-4.97)	
<b>Education</b>		
Above primary school	1	0.29
Less than primary school	1.44 (0.73-2.87)	
<b>Marital status</b>		
Married	1	0.06
Single/divorced/separated/widow/widower	3.28 (0.94-11.45)	
<b>Living with</b>		
Spouse	1	0.58
Children/Single	1.37 (0.44-4.29)	
<b>Financial status</b>		
Dependent	1	0.023
Independent	2.40 (1.12-5.12)	
<b>Comorbidities</b>		
One or more comorbidities	1	0.008
No comorbidities	4.34 (1.47-12.78)	

Persons aged more than 70 years were 2.23 times more at risk of developing depression compared to people less than 70 years (OR-2.23, 95% CI 1.01-4.97,  $p=0.04$ ), persons with financial dependency on children or others were having 2.4 times more risk in developing depression than financially independent (OR-2.4, 95% CI 1.12-5.12,  $p=0.023$ ) and having one or more comorbidities were found to be 4.34 more times chance of having depression compared to persons without any comorbidities (OR-0.008, 95% CI 1.47-12.78,  $p=0.008$ ) (Table 3).

## DISCUSSION

### *Prevalence of geriatric depression*

In this study, the prevalence of depression among the people aged 60 years and above was 72.4%, which was very high. Most of the studies conducted in other countries and India showed the prevalence between 6%-53%.<sup>4-10</sup> Prevalence of geriatric depression in studies conducted in other Asian countries by Sherina M et al in Malaysia was 6.3%, Taqui AM et al in Pakistan was found to be 19.5% and Khattri JB et al in Nepal was 53.2%.<sup>4,11,10</sup> The studies conducted in India showed a varied geriatric depression prevalence ranging from 12.7% to 52.2%.<sup>5-9,14</sup> Rajkumar AP et al at rural south India found prevalence of 12.7%, Barua A et al at South India showed a prevalence of 21.7%, Jariwala V et al at Gujarat found a prevalence of 39.04%, Jain RK et al found a prevalence of 45.9% in urban slums of Mumbai and Nandi P et al in rural community of West Bengal showed a prevalence of 52.2%.<sup>5,6,8,9,14</sup> Sandhya GI conducted a study in rural community of South Kerala and found a geriatric depression prevalence of 25.4% and compared to all these studies, the geriatric depression prevalence in our study was very high which involves almost three fourth of the study participants.<sup>7</sup>

### *Factors affecting geriatric depression*

Most of the studies showed that female gender has higher risk of developing geriatric depression than males and in our study univariate analysis showed same association as other studies but in multiple regression there was no association found between female and male gender but a meta-analysis done by Cole M et al showed that female gender was at higher risk of developing depression.<sup>4,5,11,14,15</sup>

In this study, the people aged more than 70 years found to have two times higher risk of developing depression than people aged less than 70 years and which was similar to studies done by Sherina M et al at Malaysia and Jariwal V et al at Surat, but this age group difference was not found significant in other studies and a meta-analysis done by Cole M et al.<sup>4,5,7,8,11,15</sup> The factors such as less than primary school education, never married or divorced or separated or widow/er, living single or with children

(after the death of the spouse) were found to be significantly associated with geriatric depression in univariate analysis as in other studies but these factors were not associated with depression in multiple regression in our study which was similar to other studies in which have done multiple regression was done.<sup>5,7-9,11,15</sup>

The financial dependency of the older person on others has 2.4 times more risk of developing depression than who were independent and this finding was similar to other studies.<sup>4,5,9,11</sup> The other important factor which was having 4.34 times higher risk for geriatric depression was people with one or more comorbidities and this was found similar in most of the studies.<sup>4,5,7</sup>

The people who were found to be depressed in this study were given brief counseling and advised to attend our health centre for more health facilities which will help us in diagnosis and treatment, since the delay in diagnosing and treating minor mental illness will lead to severe neuropsychiatric problems in the elderly.

The limitations of the study were data collection done by convenient sampling method, few data were collected from persons attending outpatient services of health centre, errors in translation of the questions into local language during interview and their interpretation by the interviewers and grading of the depression based on the GDS short form score is not possible to check the severity of depression. Apart from GDS short form scoring no other tests were done to confirm the geriatric depression.

So, in this study the main factors associated with geriatric depression were people aged more than 70 years, financial dependency on others and with one or more comorbidities.

## CONCLUSION

By this study we can conclude that, the prevalence of geriatric depression in rural community of the North Kerala is alarmingly high (72.4%) and the commonest factors associated with geriatric depression were people aged more than 70 years, financial dependency on others and having one or more comorbidities. Since, the proportion of elderly population is high in Kerala, India, there is a need to strengthen the mental health programme in the primary health centres with dedicated staff looking after geriatrics and mental health. Most of the factors associated with depression relates to dependency on others and loneliness, giving health education to family members to spend more time with elderly and promoting the social life among elderly may decrease the chance of depression. Creating awareness to the elderly people about the availability of social security schemes for them from the government, which may help them by little extent to be financially independent. Since most of the



people with comorbidities are at risk of developing depression, there is a high need of family support and health support to the elderly in preventing depression.

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