Section: Geriatrics

Original Research Article

PREVALENCE AND ASSOCIATED FACTORS OF DEPRESSION AMONG THE ELDERLY IN A RURAL AREA OF KERALA- A COMMUNITY BASED STUDY

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ABSTRACT

Background: Growing elderly population is a major concern world -wide. According to World Health Organization, depression is one of the major causes of illness burden which ranks 4th of all major illness, and it is a common disorder among elderly which affects the daily function and contributes to functional decline and increasing mortality. The state of Kerala has highest number of elderly in India. Objective was to study the prevalence of depression among elderly in a rural setting and the factors associated with it. A community based cross sectional study of elderly population in a rural area of Malappuram District of Kerala. Data was collected during January 2013 to July 2014.

Methods: A total of 660 elderly selected by simple random sampling were interviewed in their houses. Geriatric Depression Scale -15 was used to detect the prevalence of depression among them and Hindi Mental State Examination was used to assess the cognitive status.

Results: The prevalence of depression was found to be 50.15%. Majority of them belonged to 60-70 age group, most of them were literates and unskilled workers. More than 50% were unemployed. Majority of them were living with their children and half of them were depending on them. Married elders outnumbered those who were single. Diabetes and hypertension were leading among the co-morbidities. The factors found to be associated with depression were age, religion followed, socio economic class, educational status, the type of family, living alone, habits like smoking and alcohol intake and few of them had cognitive impairment

Conclusion: Prevalence of depression among elderly in rural area in Kerala was high, with age, lower education, smoking, and certain sociodemographic factors significantly associated; Being a non-smoker and having high school level of education was found to be protective against depression in the geriatric age group in this study.

Keywords: Community Based Study, Elderly, Rural area, Geriatric Depression Scale 15, Associated Factors.

INTRODUCTION

Growing elderly population is a major concern world -wide. Keeping them healthy and active is a big challenge especially in developing countries. Healthy ageing stresses on physical, mental and social wellbeing. A systematic review and meta-analysis done recently showed that the prevalence of depression among the elderly population in India was 34.4% (95%CI: 29.3-39).[1] Consequently, elderly persons with depression have significantly higher suicidal and non-suicidal mortality.[2]

"Ageing with dignity" is the theme for international day of older persons in 2024. The number of elderly people above 65 years or older is projected to be more than double from 2021 to 2050. Population ageing is poised to be one of the significant social transformations of 21st century.[3]

The risk factors for late life depression are – cognitive impairment, persistent insomnia, prior history of depression, significant illness burden.[4]

Cognitive function is the ability to attend to things in a focused and selective manner, able to concentrate over a short period,to learn, absorb, store, integrate and utilize information. This includes functions such as orientation, memory, calculation, conceptualization, judgment, visual-spatial processing etc. Mild cognitive impairment is an intermediate state between normal cognition and dementia and in such cases depression needs to be ruled out. Both depression and dementia have serious consequences, and this includes decreased quality of life, functional decline, and high mortality.[5,6]

Diagnostic interview is the cornerstone of assessment and treatment assignment for older adult with psychiatric impairment. Depression symptom checklist, the Geriatric Depression Scale(GDS; Yesavage et al.1983) is useful in determining the degree to which an individual suffers from depression in late life,[7] this scale is used widely in assessing depression among senior citizens. Depression is a disorder of major public health importance, in terms of its prevalence and suffering, relationship dysfunction, morbidity, economic burden to the family, further leading to social withdrawal and loneliness among sufferers. The dearth of data regarding this problem among senior citizens in this setting, led to conducting this research.

MATERIALS AND METHODS

A Community Based Cross sectional study was conducted in the Vettathur Grama Panchayat of Malappuram district in Kerala from January 2013 to July 2014. Study participants were people above the age of 60 years who were residents in Vettathur Panchayath which had 16 wards spread over 35.84 square kilometers. Field staff from primary health centre, Accredited Social Health Activists (ASHAs) and Anganwady workers assisted in scheduling and organizing the interviews.

Sample size calculation was done as follows.

$n = \frac{4 \times p \, q}{d2}$

P = 21% q = 1-p d^2 = permissible error of p.

The sample size calculated was 660.

The recent electoral list was collected from the respective ward members for all 16 wards in the Panchayath and the elderly citizens were serially numbered, after excluding all those marked as expired, simple random sampling done from wards in the Panchayath including field area of Rural Health and Training Centre, Department of Community Medicine situated at Pattikkad. Total population aged 60 years and above was 2379 according to the voters list. Using random table, a list above 60 citizens for the panchayath was made from the electoral list and data collected visiting their residence with prior appointment.

Dementia is common in elders and thus Hindi Mental State Examination (HMSE) which is a modified version of the Mini Mental State Examination8,9. was used to assess the cognitive function, a screening instrument for illiterate rural elderly population in India. It assesses functions including arithmetic, memory and orientation. A score of 23 or above is considered as having no cognitive problem.

GDS is a commonly used tool, for assessing depression in old age, in this self rating scale, participants can rate their responses as either present or absent. The scale includes questions on symptoms such as cognitive complaints, self-image and losses.[9,10] The validated version of this scale was used to assess the presence of depression. For this study "depression" was operationally defined as the presence of a score above 5, (depressive symptoms) according to GDS short form- 15.

Institutional scientific and ethical committee approval were taken, Panchayath president approval and individual participant's informed consent was obtained prior to interview.

RESULTS

Total participants were 660 and 52.4% were males and the age of the participants ranged from 60 to 95 years. Mean age of the participants was 66.07 years (+ 6.68). Majority of the participants (81.2%) were between 60 and 70 years, 15.8% belonged to 71-80 years and 3.1% were > 80 years.

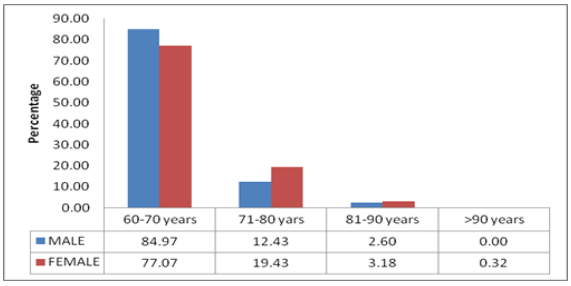

Figure 1: Gender wise distribution of the elders according to the age group (n=660)

Table 1: Sociodemographic characteristics of the participants n=660.

Characteristics		N	%
Gender distribution	Male	346	52.43 %
	Female	314	47.57%
Religion Followed	Muslims	409	62 .0 %
	Hindus	238	36.0 %
	Christians	13	02.0 %
Education status	Primary school	232	35.15 %
	U P school	139	21.06 %
	High School	88	13.33 %
	Illiterates	201	30.45 %

Living arrangement	Living with family	323	48.93 %
	Living with children	318	48.18 %
	Living alone	17	2.57%
	Other arrangement	2.0	0.30/
Marital status	Married	412	62.4%
	Unmarried	22	3.3%
	Widow/widower	216	32.8 %
	Separated	6	0.9%
	Divorced	4	0.6%

Socio economic status (SES) class distribution showed that majority belonged to Class I & II together accounted for 71.2% and the distribution was as follows, SES Class I – 46.96%, Class II 24.24%, Class III 18.05% Class IV 9.09% and Class V was the least 1.66 %. Overall 75% of the economically dependent elderly were supported by their children and grand children10.

Our study showed that 47.58% were unskilled workers and most were manual labourers, 31.82% were home makers, 10% were unemployed which were mostly men who returned from Saudi Arabia due following the labour restrictions. Equal distribution of semi skilled and skilled workers seen, was around 2% each and only 1 of them was a professional. Elderly reported following habits, 28.9% were smoking, 3.6% were taking alcohol, 5.8% were chewing paan. Gender difference in smoking was marked, males predominated in smoking and consumption of alcohol, whereas chewing paan was equally habituated by both gender groups.

Geriatric population is vulnerable to chronic ailments, the risk of non communicable diseases (NCD) like hypertension, diabetes mellitus increases with age. Co-morbidities worsen the outcome of depression, and depression is common among those who have co- morbidities. The prevalence of self reported NCDs were, diabetes mellitus 38.4 %, hypertension 35.3%, heart disease 5.6%, stroke 0.9%, COPD 4.5%.

Prevalence of depression was 50.15% (CI 47-54%) in our study, which is consistent with the WHO estimation that 50% of the aged are depressed11.

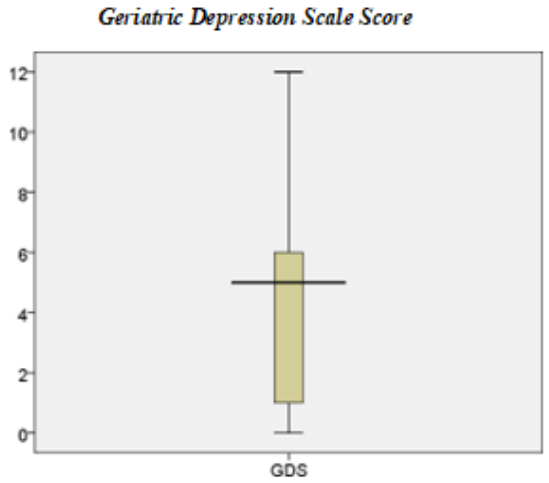

Figure 2: BOX PLOT – GDS

Cognitive impairment, characteristic of dementia was screened for, in old age precedes the onset of depression. Cognitive decline might be a concurrent or underlying factor that contributes to the development of depression, as well as being a symptom of dementia12. Here 22.73% were found to have cognitive impairment. Mean age of the depressed was 67.54 (± 6.99) and those not depressed 65.5 (±5.69) respectively.

Age was found to be associated with depression. The maximum proportion of depressed people, that is 70% were found in > 80 years age group, followed by 68.3% in the 71-80 years group and 45.9% in the 60-70 years age group. Even though those > 80 years were very few in number, they were at greater risk of depression. In our study depression was significantly associated with increase in the age.

Table 2: Distribution of participants with depression according to age group (n=660).

Age Group	Depressed		Not Depressed		χ^2	p-value
	n	%	N	%		
60–70 Years	246	45.89%	290	54.10%		
71–80 Years	71	68.26%	33	31.73%		
>80 Years	14	70.00%	6	30.00%	20.69	<0.001

**:- significant at 0.01 level

Table 3: Association between sociodemographic factors and depression on univariate analysis (n=660)

Independent Variables	Odds Ratio	95% CI	Significance (P)
Education			
Lower Primary	0.68	0.46 – 1.00	0.05
Upper Primary	0.82	0.53 – 1.28	0.39
High School	0.28	0.15 – 0.51	0.00 **
Illiterates (Reference)	1.00		
Age Group			
60–70 years	0.58	0.24 – 1.44	0.24

71–80 years	1.08	0.41 – 2.84	0.86
>81 years	1.00		
Religion			
Hindu	1.10	0.47 – 2.55	0.84
Muslim	1.27	0.39 – 4.12	0.69
Christian (Reference)	1.00		
Type of Family			
Nuclear Family	1.70	1.04 – 2.80	0.04 *
Joint Family (Reference)	1.00		
Living Arrangement			
Living Alone	2.71	1.02 – 7.22	0.05
Living with Others (Ref.)	1.00		
Alcohol Intake			
Not Consuming Alcohol	0.36	0.12 – 1.06	0.06
Consuming Alcohol (Ref.)	1.00		
Smoking Habit			
Non-smokers	0.47	0.32 – 0.68	0.00 **
Smokers (Reference)	1.00		

**:-significant at 0.01 level *:-significant at 0.05 level

Table 4: Association between sociodemographic factors and depression on multiple logistic regression analysis (n=660)

Independent Variables	Odds Ratio	95% CI	P value
Living Arrangement			
Living alone	1.88	0.64 – 5.51	0.25
Joint family (Reference)	1.00		
Smoking Habit			
Non-smokers	0.56	0.37 – 0.85	0.01
Smokers (Reference)	1.00		
Alcohol Intake			
Not consuming alcohol	0.45	0.15 – 1.39	0.17
Consumes alcohol (Ref.)	1.00		
Educational Status			
Lower Primary	0.71	0.48 – 1.06	0.10
Upper Primary	0.94	0.60 – 1.50	0.81
High School	0.31	0.17 – 0.60	0.00
Illiterates (Reference)	1.00		
Type of Family			
Nuclear family	1.35	0.78 – 2.35	0.29
Joint family (Reference)	1.00		
Constant	0.79		0.13

R 2 value – 0.07 Hosmer Lameshow test: □2 9.88 p value 0.195

The highest proportion of depressed people were found in > 80 years age group. Age was significantly associated with depression. Of the total 331 depressed elders, 53.5% were females and 47.1% were males found to be depressed and gender had no association with depression. As per an overview of Indian research in depression, it's more common in women than men.[13]

Religion followed showed an association with depression, majority among Hindus 56.9%, 46.9% Muslims, and 28.6% of the Christians were depressed. Religion followed was associated with depression. Of the total working elders, 31.79% and 45.01% of the not working elderly were depressed. When analyzed for the type of family, 66.2% of the elders living in the nuclear family, 48.2% of those in the joint family were depressed. There was association between the type of family and depression

Even though 52.9% of the married, 53.1% of the divorced, separated and living alone and 55.6% of the widowed participants were depressed, there was no association between marital status and depression among elders. However living alone was found to be significantly associated with depression.

Among smokers 37.7%, 57.9% of those who chew paan and 25% of those who consume alcohol were depressed. Smoking and alcohol intake was found to be associated with depression. These habits were seen mostly among men and depression was significantly associated with smoking. Maximum number of depressed were seen in SES Class I, followed by II. And Class V had the least proportion of depressed. It was seen that SES Class was significantly associated with depression. Illiterates who were depressed constituted 60.7%. High educated group had only 19.3% of depressed. Educational status was significantly associated with depression.

Cognitive status was significantly associated with depression. 64.7% of the depressed and 35.3% of the not depressed had cognitive problem. None of the reported co- morbidities was associated with depression.

Co- morbidities are a major risk factor in depression among the elderly. In our study Diabetes Mellitus was the commonest co-morbidity reported (38.5%), followed by Systemic Hypertension (35.3%), COPD 4.5%, 0.8% Cancer, 0.9% Stroke and 5.6% had history of heart disease

The results of multiple logistic regression showed that being nonsmoker and having higher education were protective factors for depression in geriatric age group. The type of family, living alone and consumption of alcohol did not show any statistical significance.

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DISCUSSION

The study conducted in a rural area revealed a high prevalence of depression among the senior citizens, with 50.15% of participants meeting the criteria as per Geriatric Depression Scale -15, and this closely aligns with the WHO estimation that upto 50% of the aged population may be affected by depression,[11] this is notably higher than the pooled Indian prevalence of 34.4% reported in a recent systematic review and meta- analysis1. This variation could be attributed to differences in study settings, screening tools, and socio demographic profiles.

Several sociodemographic factors and lifestyle factors were significantly associated with depression in elderly. Advanced age was a strong predictor, with the prevalence of depression increasing from 45.9% in the 60-70 years group to 70% in those above 80 years, consistent with existing literature that highlights age as a key risk factor for late – life depression. Although the proportion of elderly above 80 years were relatively small, the observed trend underscores the vulnerability of this group.

Educational status emerged as a significant protective factor, those with high school education had a markedly lower risk of depression compared to illiterates (OR 0.31, 95% CI 0.17- 0.60), reinforcing evidence that higher education may enhance resilience to mental health disorders by improving coping skills and social engagement. This is in concordance with studies that have shown lower depression rates among those with higher education attainment.[1]

The living arrangement and family structure also influence depression risk, those living alone were most likely to be depressed (OR 2.71, 95% CI 1.02-7.22), and those in nuclear families higher odds compared to those in joint families. Social isolation and lack of support are well – established contributors to geriatric depression, emphasising the importance of family and community systems in rural settings.

Habits like smoking and alcohol use were associated with higher depression rates. Being a non smoker was protective (OR 0.56, 95% CI 0.37- 0.85), consistent with the known bidirectional relationship between substance use and depressive symptoms. Alcohol intake showed a trend towards increased risk, but did not reach statistical significance in multivariate analysis, probably due to the low prevalence of alcohol use in the sample.

Cognitive impairment was significantly more common among those with depression (67.7% vs 35.3%), supporting the recognized interplay between cognitive decline and mood disorders in the elderly. Depression and cognitive impairment often co exist, and each can exacerbate the other, leading to further functional decline and increased mortality risk.

Contrary to some studies,[14] the present analysis did not find a significant association between depression and reported co-morbidities despite their high prevalence. This may reflect underreporting differences, differences in disease severity, or the dominant influence of social and psychological factors in this rural cohort.

SES had an unexpected pattern, with higher depression rates in SES Class I and II. This contrasts with the common assumption that lower SES is associated with poorer mental and may reflect unique local factors, such as social expectations, family dynamics, or reporting biases in this population. The strengths include its community based design, adequate sample size, and use of validated screening tools suitable for rural and illiterate populations. Limitations needs to be acknowledged, participants screened for depression by this tool needs an additional confirmation by a psychiatrist to diagnose and start the treatment.

The cross- sectional nature precludes causal inference, self reported data may be subject to recall bias. The exclusion of institutionalised or severely ill elderly may have led to underestimation of depression prevalence in the most vulnerable groups.

CONCLUSION

To summarise- this study highlights a substantial burden of depression among rural elderly in Kerala and identifies modifiable risk factors such as education, social support and smoking cessation as potential targets for intervention. These findings

underscore the need for integrated geriatric mental health services, community outreach, and policies promoting healthy ageing. Future research should explore longitudinal trajectories of depression and evaluate the effectiveness of targeted interventions in similar settings.

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