International Journal of Community Medicine and Public Health
Girijammal R et al. Int J Community Med Public Health. 2022 Dec;9(12):4430-4435
http://www.ijcmph.com
pISSN 2394-6032 | eISSN 2394-6040

DOI: https://dx.doi.org/10.18203/2394-6040.ijcmph20223006

Original Research Article

Prevalence of depression among elderly in an urban setting of Southern India

Remya Girijammal[1]*, Sara Varghese[1], Retheesh K. Haridasan[1], Pankajakshan V. Indu[2]

[1]Department of Community Medicine, Government Medical College, Thiruvananthapuram, Kerala, India
[2]Department of Psychiatry, Government Medical College, Thiruvananthapuram, Kerala, India

Received: 17 October 2022
Revised: 13 November 2022
Accepted: 15 November 2022

***Correspondence:**
Dr. Remya Girijammal,
E-mail: drremyag87@gmail.com

ABSTRACT

Background: The reported prevalence of depression by WHO in the elderly varied between 10% to 20% in various societies. Some of the 121community-based studies in India had reported a prevalence of 13 to 43% depression in elderly. Kerala had a 12.8% of geriatric population according to census 2011. The aim of the study was to find out the prevalence of depression among geriatric population in an urban area which comes under Thiruvananthapuram Corporation, Kerala state, India.
Methods: Study design is cross sectional. Elderly over 60 years were interviewed using PHQ -9 questionnaire. Depression is diagnosed when the total score is equal to more than 5 in PHQ-9 questionnaire.
Results: Total 405 elderly were included in the study. 195 (52%) were females and 213 (48%) were males. The prevalence was found to be 37.3% (CI, 30.78-43.98). Among them mild and moderate depression accounted for majority of cases (35.7%) than severe depression (1.5%). Bivariable analysis yielded factors such as previous history of mental illness, family history of mental illness, stress and absence of recreation that were associated with the development of depression. Family history of mental illness (adjusted OR 4.59) and stress (adjusted OR 7.43) were emerged as predictors of depression in this study in multivariable analysis.
Conclusions: Prevalence of depression in elderly was found to be 37.3% (30.78-43.98) in an urban population of Sothern Kerala. In logistic regression analysis family history of mental illness and stress were emerged as independent predictors of depression among elderly.

Keywords: Depression, Elderly, PHQ-9

INTRODUCTION

Depression is an illness that affects the mind and body. Depression is characterized by sadness, loss of interest or pleasure, feelings of guilt or low self-esteem, disturbed sleep or appetite, fatigue, and poor concentration.[1] According to WHO global burden of disease survey, about 350 million people are suffering from depression.[2]

Depression in old age is an important public health problem as it causes considerable morbidity and mortality worldwide.[3] Along with physiological and psychological changes associated with ageing, changes in risk factors increases the prevalence and prognosis of depression in elderly.[4]

Under-diagnosis of depression in older adults is a serious issue because the symptoms of depression are assumed to be a normal part of ageing.[5] The reported prevalence of depression by WHO in the elderly varied between 10% to 20% in various societies. Research about depression had increased in recent years especially among geriatric population, and were done mostly in the developed nations. Studies on elderly population in the community, inpatient, outpatient, and old age homes had shown

depression as the commonest mental illness in elderly.[3,6] Some of the community based studies in India had reported a prevalence of 13 to 43% depression in elderly.[7,8] Kerala with health indicators comparable with that of developed nations had a 12.8% of geriatric population according to census 2011. Still mental health issues of that age group are poorly met. Prevalence of depression estimated in a community study from Thrissur district was 39.1%.[9] The prevalence of depression in elderly varies depending on the study setting whether rural or urban. Thiruvananthapuram the capital city of Kerala is lacking studies about geriatric depression.

The aim of the study was to assess the prevalence of depression among geriatric population in an urban area which comes under Thiruvananthapuram Corporation, Kerala state, India.

METHODS

The study design was community based cross sectional study, conducted at the field area of urban health training center of Government Medical College Thiruvananthapuram which is situated under Thiruvananthapuram corporation which covers a population of 1,18,000 in 12 wards. Study population was elderly (60 years and above) residents of the study area. Data was collected from 2015 May to 2016 February.

Sample size

The sample size was estimated using the following formula:

$$n = \frac{Z_{(\frac{\alpha}{2})^2} PQ}{D^2}$$

P is the expected prevalence of depression among elderly, which is taken as 29.3%, the prevalence of depression among elderly in South Indian state.[5] After accounting for design effect of 1.5 for the cluster sampling, the final sample size was estimated to be 408.

Sampling technique

Cluster sampling technique was done, as the sampling frame of elderly was not available for random sampling technique. There were 12 wards under Urban Health Unit of Medical College. Considering each ward as a cluster, 34 subjects were selected from each cluster, 34×12=408 (meeting the criteria). For selecting the first house from the ward random number table was used.

Inclusion and exclusion criteria

Elderly who gave consent for the study were included. Elderly who had cognitive impairment (assessed using Mini-Cog clock drawing test), or already diagnosed with diseases affecting cognitive functions were excluded from the study. Chronically ill bedridden older persons were also excluded.

Study variables

Depression was assessed using the validated Malayalam version of patient health questionnaire-9, PHQ-9 is a 9-item questionnaire based on the DSM IV criteria. PHQ-9 scores the patients symptoms during the past 2-week period as not at all (score-0), several days (score-1), more than half the days (score-2) and nearly every day (score-3) with the total possible scores ranging from 0-27. Depression is diagnosed when the total score is equal to more than 5. Cut of scores of 10, 15, and 20 were used to grade severity of depression as mild depression, moderate depression, moderately severe depression and severe depression.

Data collection tools employed in this study

Validated Mini-Cog-clock drawing test, semi-structured questionnaire for sociodemographic details and health factors, validated Malayalam version of Perceived stress scale (PSS), validated Malayalam version of PHQ 9 depression scale.

Study procedure

ASHA (Accredited Social Health Activists) workers of the filed area were oriented regarding the study for getting community support and identifying houses in each ward. Respondents were informed the purpose and objective of the study and informed written consent were obtained. Elderly persons were first tested with Mini-Cog clock drawing test for assessing their cognition. In the test the subject is asked to repeat and later recall three unrelated words told by the interviewer and to draw the face of a clock. Subjects diagnosed with cognitive impairment according to this test were excluded from the study.

Ethical consideration

Institutional ethics committee clearance was obtained before the commencement of the study. Written informed consent was obtained from all the study participants. Privacy and confidentiality of all information collected was maintained during all stages of the study.

Data analysis

The data was entered into Microsoft excel and analyzed using trial version of SPSS software. Quantitative variables were expressed as mean and standard deviation, and qualitative variables were expressed with median and interquartile range. All categorical variables were expressed in proportions. The outcome variable depression was expressed as proportion (prevalence) with 95%CI. The statistical test Chi square was done for testing the association between categorical variables and depression.

RESULTS

Out of the 408 study participants 195 (52%) were females and 213 (48%) were males. Majority of the study subjects were educated up to high school level 200 (49.1%), up to Higher secondary level 113(19.85%) subjects and 24 subjects (6%) did not receive formal education. 86% of the elderly in the study were were living in extended families (and the remaining 14% lived in nuclear families). 65.4% study samples were currently married rest included 28% widow or widowers. Of the total study participants, 63.7% had no occupation (20.6% were retired, 21% were house wives and 22.1% were too old or disabled to work). Out of the study participants 60% of subjects were not getting any pension. Some sort of disability was noted among 27.5% study participants. Among them the most common were visual (9.6%) and loco motor disabilities (7.4%).

Among the study participants 273 (67%) suffered from various co morbidities. Hypertension (41.4%) and diabetes mellitus (29.7%) were the most common co morbidities found among study participants followed by and vascular events (10.4%). Out of 408 elderly participants 7% of the participants had previous mental illness, mood disorders were the most common among them which was noted in 4.7% (19) study participants.

Prevalence of depression among study participants

Depression in the study subjects were assessed using Malayalam version of validated PHQ-9 questionnaire, which has got a minimum score of 0 and a maximum score of 25. Using this study tool, depression was diagnosed in subjects who had a score of 5 and above. The prevalence was found to be 37.3% (CI, 30.78-43.98). Severity of depression among study participants is given in the (Table 1). Symptoms present for at least more than half the days for the past 2 weeks is taken as symptom present. Table 2 shows the presence of symptoms in elderly with depression and elderly without depression. Loss of interest 61.2% is the most common symptom present in elderly with depression followed by trouble in falling sleep or staying asleep 55.9%. Case control analysis were done to find out the factors associated with depression (Table 4). Pearson Chi square was used df=1, p value significance level is <0.05, Odds Ratio above one with 95% confidence interval not including null value, denotes that the factor is a risk factor. Previous history of mental illness, family history of mental illness, stress and absence of recreation are the four factors that were associated with the development of depression (p<0.05) (Table 3).

Predictors of depression in elderly by binary logistic regression

Binary logistic regression was performed to analyze the factors predicting depression among elderly. The results are given in Table 5. All the variables with p value less than 0.2 in bivariable analysis were entered as independent variables and depression was entered as the dependent variable. Among them, Family history of mental illness (adjusted OR- 4.59), stress (adjusted OR- 7.43) were found to be statistically significant and emerged as predictors of depression by the model. R^2 of the model is 24.7 (24.7% variability among factors affecting depression can be explained by this model).

Table 1: Severity of depression among the study participants.

Category of depression	PHQ-9 score	N	%
No depression	0-4	256	62.7
Mild	5-9	64	15.7
Moderate	10-14	39	9.6
Moderately severe	15-19	44	10.8
Severe	19-27	5	1.5
Total	0-27	408	100

Table 2: Symptoms of depression.

Symptom of depression as in PHQ-9	Elderly with depression n=152 (%)	Elderly without depression n=256 (%)
Depressed mood	59 (38.8)	2 (0.8)
Loss of interest/pleasure in doing things	93 (61.2)	9 (3.5)
Tiredness	74 (48.7)	13 (5.1)
Trouble falling sleep/staying asleep	85 (55.9)	17 (6.6)
Feeling of worthlessness	82 (53.9)	19 (7.4)
Moving or speaking slowly/being fidgety or restless	67 (44.1)	7 (2.7)
Loss of appetite/over eating	63 (41.4)	8 (3.1)
Lack of concentration	66 (43.4)	12 (4.7)
Suicidal thoughts	8 (5.3)	0 (0)

Table 3: Bivariable analysis of factors associated with depression in elderly.

Variables		n (%)		OR (CI)	P value
		Depressive	Non-depressive		
Marital status	Single	60 (39.5)	81 (31.6)	1.41 (0.93-2.14)	0.13
	Currently married	92 (60.5)	175 (68.4)		
Smoking	Ever user	18 (11.8)	37 (14.5)	0.80 (0.44-1.45)	0.55
	Never user	134 (88.2)	219 (85.5)		

Continued.

Variables		n (%)		OR (CI)	P value
		Depressive	Non-depressive		
Alcoholism	Ever user	75 (11.2)	17 (6.6)	1.77 (0.88-3.60)	0.14
	Never user	135 (88.8)	239 (93.4)		
Recreation	No recreation	109 (71.7)	148 (57.8)	1.85 (1.22-2.8)	<0.05
	Recreation present	43 (28.3)	108 (42.2)		
Co-morbidities	Present	116 (76.3)	193 (75.4)	0.95 (0.59-1.52)	0.91
	Absent	36 (23.7)	63 (24.6)		
Previous history of mental illness	Present	17 (11.2)	12 (4.7)	2.56 (1.2-5.5)	<0.05
	Absent	135 (88.8)	244 (95.3)		
Family history of mental illness	Present	29 (19.1)	12 (4.7)	4.79 (2.36-9.72)	<0.001
	Absent	123 (80.9)	244 (95.3)		
Stress	Present	109 (71.7)	61 (23.8)	8.1 (5.1-12.8)	<0.001
	Absent	43 (28.3)	195 (76.2)		

Table 4: Predictors of depression in elderly.

Variables	Category	Adjusted OR	95% CI	P value
Marital status	Single	1.33	0.81-2.17	0.25
Alcoholism	Present	1.36	0.59-3.12	0.46
Recreation	Absent	1.53	0.93-2.53	0.09
Disability	Present	1.39	0.82-2.36	0.21
Previous history of mental illness	Present	1.54	0.64-3.70	0.33
Family history of mental illness	Present	4.59	2.03-10.21	<0.001
Stress	Present	7.43	4.61-13.97	<0.001

DISCUSSION

Prevalence of depression among elderly was 37.2% in the present study. Prevalence of depression in elderly varied in different settings probably due to difference in the methodology used.

Previous studies had shown that prevalence of depression in community samples of elderly in India vary between 13% to 43%.[7] A study conducted in Thrissur district of Kerala had reported a similar prevalence and severity of depression in elderly (39.1%).[9] Wada et al from Japan had reported depression in 33.5% of elderly population.[11] Study conducted in elderly population of Pakistan showed a prevalence of 40.6%.[12] The figures suggest that the prevalence in the present study is in par with other studies in developing and developed countries.

Variations in prevalence were noticed on the basis of the study tool used. Study conducted in Chitoor district Andhra Pradesh used Geriatric depression scale reported prevalence of depression among elderly as 43%.[13] When ICD-10 diagnostic criteria was used by Nakulan et al in Thrissur district Kerala the prevalence was found to be 39.1%.[9] The Chennai Urban Rural epidemiological study (CURE study) used the PHQ-12 and had reported a prevalence of 28.1%.[14] Comparatively lower prevalence was obtained in the CURE study becausethey had modified the PHQ-9 in to a 12 item questionnaire tool and also symptoms were collected dichotomously (either yes or no), so that milder forms of symptoms were not identified.

When depression in elderly was classified according to severity based on the scores in the study tool PHQ-9, mild depression accounted for 15.7%, moderate depression 9.6%, moderately severe 10.8% and Severe depression for 1.5%. Moderate depression (moderate depression and moderately severe depression) had a greater prevalence than mild and severe depression in the present study and this is similar to the study by Rajkumar et al (mild depression 3.2%, moderate 7.6% and severe depression 1.9%). Whereas cross sectional study by Nakulan et al in Kerala had reported an almost equal prevalence of mild (15%) and moderate depression (15.9%) and 8.2% of severe depression among elderly. They had classified depression based on ICD-10.[9] This may be due to information bias where the study subject tends to pool their symptoms in to moderate category. This may be due to assessment of symptoms as in a Likert scale which can lead to (information bias). Most of the studies on depression in elderly had shown that the prevalence of severe depression is lower than milder forms of depression.[5,15] But the study conducted among elderly who had attended a primary care setting in New York showed that major depression (6.5%) was more common than minor depression (5.25%) and dysthymia (0.9%).

Greater prevalence of depression was noted among elderly with age<70 years. There were some studies which had reported that there was no gradual increase in depression with age.[16] One common thing about these studies was that sample size taken was less and majority of the subjects were below 70 years. In studies where large sample sizes were taken, age had come out as a significant factor for

depression. According to the study by Sengupta and Benjamin from Ludhiana, with fairly good sample size of 3038 elderly, the predicted OR was 5.21 for above 80 years, Confidence Interval of was between 1.9-2.2 for age group 71-80 years and OR was 1.54 for 66-70 years when the OR of the age group 61-65 was taken as reference.[17]

Prevalence of depression was found to be equal in both males and females in this study. This is contradictory to observations from majority of studies where female preponderance was reported in case of geriatric depression.[3,15,18] There are some studies where female gender was not identified as a significant factor for depression.[4,19] Males diagnosed with depression were comparatively more than females in these studies when compared to other studies.

Among the elderly with depression majority of the subjects belonged to low educational status and were without occupation. However the present study could not find the statistical significance of depression with those factors because the sample size for the present study was calculated for a cross sectional study hence not have sufficient power needed for a case control study. Looking at the marital status, currently married elderly (60.5%) outnumber the elderly who were not living with their spouse (39.5%). It was observed that studies with small sample size (<400), marital status gained significance than with studies that had sample size of 400 or more. This observation might be due to the greater proportion of widows than widowers in studies with smaller sample size and female sex was associated with depression.[4,5,9,20] Previous studies has shown that greater number of elderly with depression belonged to low socio economic status and in the present study 63.2% elderly with depression belonged to higher socioeconomic status.[15,21]

Many studies done on subjects with depression had shown a higher level of co morbidities.[10,22] The present study had showed an almost equal prevalence of co morbidities among depressed and normal elderly (76.3% and 74.3%). Co-morbidities per se were not statistically significant here unlike other studies (Sagar et al). In the case control study by Sagar et al physical illnesses associated with depression were osteo-arthritis (77.5%) and hypertension (55%).[22] Previous history of mental illness and recreation had lost their significance in the regression analysis due to possible confounding effect. Some factors usually associated with depression such as increase in age, female sex, low SES, marital status, alcoholism, co-morbidities, nuclear family, dependence on family members and disability had failed to attain significance as risk factors in the present study. Stress in the present study was assessed using the perceived stress score. The prevalence of stress among elderly was 71.1%. Lueboothavatchai in Thailand had studied the association between stress and depression through a case control design and had found moderate to severe stress as a predictor of depression in middle aged women.[23]

Limitations

The socio-economic status was calculated based on income reported by the subject. This may not truly reflect the real socioeconomic status of the family. Co-morbidities like hypertension and diabetes were not assessed objectively. Self-reported statuses of the diseases were assessed. Therefore, previously undiagnosed cases were missed.

CONCLUSION

This cross-sectional study was conducted in the UHTC field area, (which comes under Government Medical College Thiruvananthapuram) among elderly (aged 60 years and above) with an objective to find out the prevalence of depression among them. Prevalence of depression among elderly (using the PHQ-9 tool) was 37.2% in the present study. Among them mild and moderate depression accounted for majority of cases (35.7%) than severe depression (1.5%). Majority of the study subjects had reported loss of interest or loss of pleasure in doing things. Bivariable analysis yielded 4 factors that were associated with the development of depression. They were previous history of mental illness, family history of mental illness, stress, recreation. Multivariable analysis confirmed the independent effect of two variables which were family history of mental illness (adjusted OR 4.59) and stress (adjusted OR 7.43) and these factors had emerged as predictors of depression in this study.

Funding: No funding sources
Conflict of interest: None declared
Ethical approval: The study was approved by the Institutional Ethics Committee

REFERENCES

1. WHO. The World health report: 2001: Mental health: new understanding, new hope. Geneva: WHO; 2021.
2. WMH. Day 2012 small file final, 2012. Available at: https://www.wfmh.or%20small%20file%20final. Accessed on 10 October 2022.
3. Grover S, Dutt A, Avasthi A. An overview of Indian research in depression. Indian J Psychiatry. 2010;52(1):S178-88.
4. Rajkumar AP, Thangadurai P, Senthilkumar P, Gayathri K, Prince M, Jacob KS. Nature, prevalence and factors associated with depression among the elderly in a rural south Indian community. Int Psychogeriatr. 2009;21(2):372-8.
5. Sinha SP, Shrivastava SR, Ramasamy J. Depression in an older adult rural population in India. MEDICC Rev. 2013;15(4):41-4.
6. Nandi PS, Banerjee G, Mukherjee SP, Nandi S, Nandi DN. A study of psychiatric morbidity of the elderly population of a rural community in west Bengal. Indian J Psychiat. 1997;39(2):122-9.

7. Barua A, Ghosh MK, Kar N, Basilio MA. Socio-demographic Factors of Geriatric Depression. Indian J Psychol Med. 2010;32(2):87-92.
8. Wig NN. World health day 2001. Indian J Psychiatry. 2001;43(1):1-4.
9. Nakulan A, Sumesh TP, Kumar S, Rejani PP, Shaji KS. Prevalence and risk factors for depression among community resident older people in Kerala. Indian J Psychiatry. 2015;57(3):262-6.
10. Gao S, Jin Y, Unverzagt FW, Liang C, Hall KS, Ma F, et al. Correlates of depressive symptoms in rural elderly Chinese. Int J Geriatr Psychiatry. 2009;24(12):1358-66.
11. Wada T, Ishine M, Sakagami T, Okumiya K, Fujisawa M, Murakami S, et al. Depression in Japanese community-dwelling elderly--prevalence and association with ADL and QOL. Arch Gerontol Geriatr. 2004;39(1):15-23.
12. Bhamani MA, Karim MS, Khan MM. Depression in the elderly in Karachi, Pakistan: a cross sectional study. BMC Psychiatry. 2013;13:181.
13. Swaralatha N. The Prevalence of Depression among the Rural Elderly in Chittoor District, Andhra Pradesh. J Clin Diagn Res. 2013;7(7):1356-60.
14. Poongothai S, Pradeepa R, Ganesan A, Mohan V. Prevalence of depression in a large urban South Indian population--the Chennai Urban Rural Epidemiology Study (CURES-70). PLoS One. 2009;4(9):e7185.
15. Sathyanath MS, Kundapur R, Bhat US, Kiran NU. Proportion of depression among the elderly population in a rural health care setting. J Clin Diagn Res. 2014;8(1):137-9.
16. Lyness JM, Caine ED, King DA, Cox C, Yoediono Z. Psychiatric disorders in older primary care patients. J Gen Intern Med. 1999;14(4):249-54.
17. Sengupta P, Benjamin AI. Prevalence of depression and associated risk factors among the elderly in urban and rural field practice areas of a tertiary care institution in Ludhiana. Indian J Public Health. 2015;59(1):3-8.
18. Taqui AM, Itrat A, Qidwai W, Qadri Z. Depression in the elderly: does family system play a role? A cross-sectional study. BMC Psychiatry. 2007;7:57.
19. Meldon SW, Emerman CL, Schubert DS, Moffa DA, Etheart RG. Depression in geriatric ED patients: prevalence and recognition. Ann Emerg Med. 1997;30(2):141-5.
20. Reddy NB, Pallavi M, Reddy NN, Reddy CS, Singh RK, Pirabu RA. Psychological Morbidity Status Among the Rural Geriatric Population of Tamil Nadu, India: A Cross-sectional Study. Indian J Psychol Med. 2012;34(3):227-31.
21. Kennedy GJ, Kelman HR, Thomas C, Wisniewski W, Metz H, Bijur PE. Hierarchy of characteristics associated with depressive symptoms in an urban elderly sample. Am J Psychiatry. 1989;146(2):220-5.
22. Sagar RS, Mohan D, Kumar V, Khandelwal SK, Nair PG. Physical illnesses among elderly psychiatric out-patients with depression. Indian J Psychiatry. 1992;34(1):41-5.
23. Lueboonthavatchai P. Role of stress areas, stress severity, and stressful life events on the onset of depressive disorder: a case-control study. J Med Assoc Thai. 2009;92(9):1240-9.

Cite this article as: Girijammal R, Varghese S, Haridasan RK, Indu PV. Prevalence of depression among elderly in an urban setting of Southern India. Int J Community Med Public Health 2022;9:4430-5.