Depression and its determinants among elderly in selected villages of Puducherry – A community-based cross-sectional study

Karthik Balajee Laksham¹, Ramya Selvaraj¹, C Kameshvell²

¹Department of Community Medicine, Jawaharlal Institute of Postgraduate Medical Education and Research (JIPMER) Karaikal, Karaikal, ²Department of Community Medicine, Sri Lakshmi Narayana Institute of Medical Sciences (SLIMS), Puducherry, India

ABSTRACT

Background: Depression is the leading cause of disease burden in most regions of the world. But depression among the elderly is usually unrecognized and they have higher morbidity and mortality than those without depression. Aims: To estimate the prevalence of depression among the elderly and identifying its determinants in selected villages of Puducherry. Materials and Methods: This is a community-based cross-sectional study conducted in three villages in Puducherry. Systematic random sampling is done to select households. Any person above the age of 60 years is considered as elderly. After obtaining informed consent, a pretested questionnaire is administered to obtain sociodemographic characteristics. Height and weight were measured. Chronic illnesses such as diabetes, hypertension, asthma, osteoarthritis, reduced vision, hard of hearing, and substance use were self-reported. Geriatric Depression Scale – Short form questionnaire was used as a screening tool for depression. Results: Among the 359 participants, 57% were females. The mean (standard deviation) age of the participants was 67.4 (5.9) years. The majority of them belonged to nuclear family (88%), had no formal education (62%), were unemployed (69%), currently married (68%), and receiving a pension (81%). The prevalence of depression among elderly age 60 years and above is 69% [95% confidence interval (CI) 63.6–73.1). Binary logistic regression showed that single/widow [adjusted odds ratio (aOR) = 3.9, 95% CI 2.0–7.5] and hard of hearing (aOR = 2.2, 95% CI 1.1–4.1) are significant risk factors for depression. Conclusion: Prevalence of depression among elderly in this rural area is high. All elderly persons must be screened for depression and appropriate treatment should be initiated.

Keywords: Depression, elderly, geriatric, Puducherry, rural

Introduction

Depression is one of the leading causes of disease burden in most regions of the world. Globally, 300 million people are estimated to have depression. The Global Burden of Disease study has estimated that the disability-adjusted life year (DALY) due to depression is 44 million, and there is a 16.1% increase in the number of DALY's between 2006 and 2016. Depression is an important risk factor for suicide and therefore it is an important public health problem. Depression affects the quality of life of an individual, and if left untreated, it may progress and affect the overall health. To highlight the importance of depression, the World Health Day theme for the year 2017 is “Depression – Let’s Talk.” The prevalence of depression increases with age and it is one of the commonest psychiatric disorders of the elderly. Depression among the elderly is usually unrecognized. As per the Census 2011, there are 104 million elderly persons (age 60 years or above) in India, which is 8.6% of the total population. The prevalence of depression in elderly ranges from 9% to 39% in India. With the increase in life expectancy and the resulting increase in the geriatric population, the prevalence...
of depression is also expected to grow. The objectives of this study are to estimate the prevalence of depression and to find its determinants among elderly in selected villages of Puducherry.

Materials and Methods

This is a community-based cross-sectional analytical study done in three villages in the field practice area of a tertiary care research institute in Puducherry in the month of February 2017. All men and women age 60 years and above residing in the village for the last 1 year were included in the study, and seriously ill patients were excluded. Considering the prevalence of depression in elderly as 39%, with absolute precision as 5, the sample size required for this study is calculated as 366 using OpenEpi open source calculator for sample size. Systematic random sampling was used to select household from the list of all the households available in the field practice area. In each household, one elder person was selected randomly.

Study instruments

A pretested, semi-structured questionnaire was used to obtain independent variables such as age, gender, education, occupation, marital status, and comorbidity. Chronic illnesses such as diabetes, hypertension, asthma, osteoarthritis, reduced vision, hard of hearing, and substance use were self-reported. Weight was measured using bathroom-weighing scales and height was measured using measuring tapes. Geriatric Depression Scale – Short Form (GDS-SF) was used to screen for depression. The original version of the GDS was developed in 1986, and later GDS-SF was developed to screen depression among the elderly in a community setting. GDS SF is a screening tool with a sensitivity of 92% and specificity of 89%, and with moderate internal consistency (Cronbach’s alpha of 0.75) to detect depression. GDS-SF has 15 questions with “yes” or “no” responses based on how the participants have felt over the past week. Ten of the “yes” responses and five of the “no” responses are given in bold to give significance to depression. One point is scored for each bold answer. The total score of 0–4 is considered as normal, 5–8 suggests mild depression, 9–11 suggests moderate depression, and 12–15 suggests severe depression. GDS-SF tool was translated to Tamil and back-translated to check for any discrepancies. Pretesting of the questionnaire was done, and based on it modifications were done. It takes approximately 5–7 min to administer the tool for one participant.

The data are collected using the mobile application Epi Info and transferred to the desktop. The data are analyzed using IBM SPSS version 19.0. Continuous variables such as age were summarized as mean and standard deviation (SD), and categorical variables such as gender, marital status, family type, and morbidity were summarized as proportions. Chi-square test of proportion is used to test the difference in proportion. Odds ratio with 95% confidence interval (CI) is used to measure the strength of association. A P value <0.05 is considered statistically significant. Binary logistic regression is used to adjust for confounders.

The study protocol was approved by the Department of Community Medicine in the institute. Informed verbal consent was obtained before interviewing, and privacy was ensured during the interview at the house of the participant. Participants who screened positive for depression were referred to the psychiatry department of the institute for further management. Confidentiality of the participants was maintained throughout the study.

Results

There were 359 participants, and their mean (SD) age was 67.4 (5.9) years. The majority of them were females (57.4%), age less than 70 years, have no formal education (62.1%), currently married (67.7%), belong to a nuclear family (87.7%), and receive pension (81.3%). The sociodemographic characteristics and morbidity profile of the participants are shown in Table 1. Cataract (54.0%) is the most common comorbidity followed by diabetes (44.8%) and hypertension (32.0%). One-third of the participants (29.5%) have hard of hearing. Of the 359 participants,

| Characteristic                      | Frequency | Percentage |
|------------------------------------|-----------|------------|
| Gender                             |           |            |
| Male                               | 153       | 42.6       |
| Female                             | 206       | 57.4       |
| Age (years)                        |           |            |
| 60-65                              | 159       | 44.3       |
| 66-70                              | 130       | 36.2       |
| 71-75                              | 38        | 10.6       |
| ≥76                                | 32        | 8.9        |
| Education                          |           |            |
| No formal education                | 223       | 62.1       |
| Primary                            | 86        | 24         |
| Middle                             | 31        | 8.6        |
| High school and above              | 19        | 5.3        |
| Employment                         |           |            |
| Unemployed/retired/home maker      | 247       | 68.8       |
| Employed                           | 112       | 31.2       |
| Marital status                     |           |            |
| Single/widow                       | 116       | 32.3       |
| Married                            | 243       | 67.7       |
| Family type                        |           |            |
| Nuclear                            | 315       | 87.7       |
| Joint                              | 44        | 12.3       |
| Receiving pension                  | 292       | 81.3       |

| Comorbidity*                       |           |            |
| Cataract                           | 194       | 54.0       |
| Diabetes                           | 161       | 44.8       |
| Hypertension                       | 115       | 32.0       |
| Hard of hearing                    | 106       | 29.5       |
| Alcohol use                        | 77        | 21.4       |
| Osteoarthritis                     | 74        | 20.6       |
| Smoking                            | 55        | 15.3       |
| Asthma                             | 17        | 4.7        |

*Multiple response types. One individual may have any number of morbidities.
246 (69%, 95% CI 63.6–73.1) have depression (GDS ≥5). Among them, 137 (56%) have mild depression, 61 (25%) have moderate depression, and 48 (19%) have severe depression. The determinants of depression are shown in Table 2. Binary logistic regression showed that single/widow [adjusted odds ratio (aOR) = 3.9, 95% CI 2.0–7.5] and hard of hearing (aOR = 2.2, 95% CI 1.1–4.1) are significant risk factors for depression.

### Discussion

In our study, the prevalence of depression among the elderly age 60 years and above is 69%. This is higher than prevalence reported by studies from other parts of the country. The high prevalence of depression in our study could be because of difference in study setting and use of different tools such as the Goldberg and Bridges' Scale or the International Classification of Diseases 10th Edition. Being single or widow is a significant risk factor for depression, and this observation is also noted in studies done by Udayar et al. and Kamble et al. Presence of chronic illnesses such as hard of hearing and current alcohol use are significant risk factors as observed in other studies. However, in contrast to other studies, gender is not a major determinant for depression.

The National Program for Health Care of the Elderly envisages operating geriatric out-patient department (OPD) in primary health centers (PHCs). During this OPD, elderly patients have to be screened for depression, as early diagnosis and treatment improve their quality of life. However, there is a shortage of psychiatrists in the country in comparison to the burden of psychiatric morbidity. The number of psychiatrists per one lakh population in the country varies from 0.05 to 1.2, much lesser than the high-income countries. Posting psychiatrists in all the PHCs across the country is not feasible. The only option left is to train the primary care physicians in mental health as proposed by the National Mental Health Program. By integrating mental health in primary care, elderly patients having depression can be identified at an early stage and can be managed at the PHCs.

Psychological counseling can be provided at community-based day care centers to improve depression and quality of life of the elderly.

The strength of this study is that this is a community-based study using a validated tool. Systematic random sampling was used and so the chance of selection bias is reduced. However, there were few limitations in this study. Depression was identified using a screening tool and not confirmed by a psychiatrist. GDS does not assess for suicidality. The comorbidities measured were self-reported by the participants, and there is a possibility of undiagnosed morbidity leading to underreporting of their chronic illnesses.

### Conclusion

The prevalence of depression among elderly in this rural area is high. Single/widow and hard of hearing are significant risk factors for depression. All elderly persons must be screened for depression and treatment should be initiated.

### Acknowledgment

Dr. Giridharan AB, Dr. Gnanakumar SP, Dr. Balamurugan S, Dr. Chandru M, and Dr. Dasaprakash A assisted us in data collection and entry.

### Financial support and sponsorship

Nil.

### Conflicts of interest

There are no conflicts of interest.

### References

1. World Health Organization. Depression and Other Common Mental Disorders: Global Health Estimates. Geneva: World Health Organization; 2017.
2. Abajobir AA, Abate KH, Abbafati C, Abbas KM, Abd‑Allah F, Abdulkader RS, et al. Global, regional, and national disability‑adjusted life‑years (DALYs) for 333 diseases and injuries and healthy life expectancy (HALE) for 195 countries and territories, 1990–2016: A systematic analysis for the Global Burden of Disease Study 2016. Lancet 2017;390:1260‑344.
3. Central Statistics Office. Elderly in India – Profile and Programmes 2016. Ministry of Statistics and Programme Implementation, Government of India, New Delhi; 2016.
4. Udayar S, Prasad D. Epidemiological study of socio demographic factors in relation to depression among the elderly people in a rural area of Chittoor district of Andhra Pradesh, India. Int J Community Med Public Health 2016;3:161‑5.
5. Kamble SV, Dhumale GB, Goyal RC, Phalke DB, Ghodke YD. Depression among elderly persons in a primary health centre area in Ahmednagar, Maharashtra. Indian J Public Health 2009;53:253‑5.
6. Rajkumar AP, Thangadurai P, Jacob KS. Nature, prevalence and factors associated with depression among the elderly.
in a rural south Indian community. Indian J Psychiatry 2010;52:524.

7. Barua A, Das A, Nagaraj K, Vinod Bhat H, Nair N. Depression in elderly: A cross-sectional study in rural South India. JIMSA 2007;20:259-61.

8. 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;59:3.

9. Goel PK, Muzammil K, Kumar S, Singh JV, Raghav SK. Socio-demographic correlates of depression among elderly slum dwellers of North India. Nepal J Epidemiol 2014;4:316-22.

10. Dean A, Sullivan K, Soe M. OpenEpi: Open source epidemiologic statistics for public health, version 3.01; 2014.

11. Sherry A. Greenberg. The Geriatric Depression Scale: Short Form. Am J Nurs 2007;107:60-9.

12. Weintraub D, Oehlberg KA, Katz IR, Stern MB. Test characteristics of the 15-item Geriatric Depression Scale and Hamilton Depression Rating Scale in Parkinson disease. Am J Geriatr Psychiatry 2006;14:169-75.

13. Dean A, Arner T, Sunki G, Friedman R, Lantinga M, Sangam S, et al. Epi Info™, a database and statistics program for public health professionals. CDC, Atlanta, GA; 2011.

14. IBM Corporation. IBM SPSS Statistics for Windows. Armonk, NY; Version 20.0; 2010.

15. Pilania M, Bairwa M, Khurana H, Kumar N. Prevalence and predictors of depression in community-dwelling elderly in rural Haryana, India. Indian J Community Med 2017;42:13.

16. Goswami S, Deshmukh PR, Pawar R, Raut AV, Bhagat M, Mehendale AM. Magnitude of depression and its correlates among elderly population in a rural area of Maharashtra: A cross-sectional study. J Fam Med Prim Care 2017;6:803-12.

17. Buvneshkumar M, John KR, Logaraj M. A study on prevalence of depression and associated risk factors among elderly in a rural block of Tamil Nadu. Indian J Public Health 2018;62:89-94.

18. Akhtar H, Khan AM, Vaidhyanathan KV, Chhabra P, Kannan AT. Socio-demographic predictors of depression among the elderly patients attending out patient departments of a tertiary hospital in north India. Int J Prev Med 2013;4:971-5.

19. Grover SM. Depression in elderly: A review of Indian research. J Geriatr Ment Health 2015;2:4-15.

20. Ministry of Health and Family Welfare. National Programme for Health Care of the Elderly (NPHCE): Operational Guidelines 2011. New Delhi, India: Director General of Health Services, MOHFW, Government of India; 2011.

21. Gururaj G, Varghese M, Benegal V, Rao G, Pathak K, Singh L, et al. National Mental Health Survey of India, 2015-16: Mental Health Systems. Bengaluru, India: National Institute of Mental Health and Neuro Sciences. NIMHANS Publ. No. 130; 2016.

22. Ministry of Health and Family Welfare. National Mental Health Programme (NMHP) for India. New Delhi, India: Government of India; 1982.

23. Sarkar S, Kattimani S, Premarajan KC, Roy G. Impact of attendance in a daycare centre on depression among elderly in rural Puducherry: A pre- & post-intervention study. Indian J Med Res 2017;146:568-76.