Prevalence of Depression in an Urban Geriatric Population in Marathwada Region of Western India

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ABSTRACT

Background: Depression is a common problem in the elderly but is often undetected and ignored as a medical problem, leading to poor quality of life. This community-based study was conducted to know the burden and risk factors of depression among the elderly. Subjects and Methods: The survey was done in 2015 in Maharashtra, India as a part of an initiative addressing community mental health needs of the elderly. Total 400 elderly, aged 60 years and above, were selected through a house-to-house survey, using probability proportional to size method, and interviewed for depression using Major Depression Inventory Scale (MDI Scale), and other potential risk factors using a pretested questionnaire. Results: A total of 16.75% elderly had depression. Increasing age (Spearman’s rho = 0.112, \( P = 0.026 \)), illiteracy (OR = 2.23; 95% confidence interval, CI 1.22–4.07), lack of sleep (OR = 2.97; 95% CI 1.73–5.09), and leisure time spending alone (OR = 0.57, 95% CI 0.34–0.98) were found to be associated with depression. However, on multivariate analysis, only sleep duration <6 h was found to be associated [AOR = 2.6; 95% CI 1.4–4.6]. Conclusions: There is a considerable burden of depression in the elderly, reemphasizing the need for regular screening for this disorder and its risk factors.

Key words: Depression, geriatric, prevalence

INTRODUCTION

Ageing is a normal process which is associated with physical, social, and psychological changes. As the age advances, there is increased morbidity and functional loss. Various life events experienced by the elderly population can greatly impact their psychological status, making them more prone to depression. No wonder depression is the leading mental health problem among the elderly. It refers to a range of mental problems characterized by loss of interest and enjoyment in ordinary experiences, low mood,
and associated emotional, cognitive, physical, and behavioral symptoms. Currently, depression is the third leading contributor to the global disease burden but will rise to the first place by 2030. The Global Burden of Disease projections show that depression will be the single leading cause of Disability Adjusted Life Years by 2020 in the developing world.

Depression in the elderly is yet to receive its due recognition in India. Few community-based studies have been conducted in India so far to address this issue. Several studies in the elderly population have examined the prevalence of depression across India, with results ranging from 6% to 62%. Methodological differences may account for this variability. Studies to assess the depression among the elderly population have not been done in the Marathwada region. Keeping in mind the different problems of the elderly, the need was strongly felt to assess the prevalence of depression and its determinants among the elderly, to plan regionally sensitive intervention strategies for engaging, and empowering the elderly against depression. The objective of this study was to assess the prevalence of depression in an elderly population of Aurangabad.

SUBJECTS AND METHODS

This cross-sectional survey was done from October 2014 to March 2015 as a part of an initiative of addressing community mental health needs of the elderly. The urban field practice area of Department of Community Medicine, Government Medical College and Hospital, Aurangabad, Maharashtra. Figure 1 includes seven administrative wards spanning a total population of 72,967 and a geriatric population of 6676. For sample size calculation, we estimated a sample size of 409 subjects for an estimated prevalence of 41.1%, 5% precision, 95% confidence level, and 10% contingency. We thus planned to recruit 59 subjects from each ward by systematic random sampling. A landmark was identified in each ward where a bottle was rotated, and the house pointed by mouth-end of the bottle was selected as the first household. Thereafter, every 20th house was visited by left-hand rule, and all elderly in the household were recruited until the required sample size from that ward was obtained. Institutional Ethical Committee approval was obtained before the start of the study.

Inclusion criteria were age above 60 years and being resident of the area for more than 6 months. Those who had an inability to answer the assessment questionnaire due to serious hearing problems or severe communication disorder, those who refused to participate in the study, and guests visiting the household were excluded.

After taking oral informed consent and explaining the nature of this study, each study subject was moved to a separate room in their home. They were interviewed with pretested and predesigned questionnaire, asking for the demographic profile, depression, and risk factors. The potential risk factors were identified from various previous studies and reviews. Depression was assessed using Major Depression Inventory (MDI) Scale, which is a brief six-point rating scale with a score ranging from 0 to 50 and a score equal to or above the cut-off of 20 indicating depression. This questionnaire was translated to Marathi and Hindi languages, and back translation was done to check the validity of the questionnaire.

When the elderly participant had difficulty in understanding the question, each question was repeated till he/she got the correct meaning of the question. Each interview was completed in approximately 30–40 min. Those reporting higher depression scores were advised to report to the hospital for complete psychiatric evaluation.

The data were collected, compiled, and analyzed using Statistical Package for Social Sciences version 20. Data were described using frequencies, percentages, means, and standard deviations to summarize characteristics of the study subjects. Association between two categorical variables was analyzed using Chi-square test, odds ratio along with 95% confidence interval (CI). Spearman rank correlation coefficient was used to determine the association of age with the level of depression. Binary logistic regression was performed to estimate unadjusted odds ratios of potential risk factors. Multivariate logistic regression was performed to control confounders. The level of significance was set at $P < 0.05$ for all analyses.
RESULTS

A total of 400 subjects were interviewed; rest nine either did not give consent or were not found at home after two more repeated visits, and the response rate is 97.8%. A total of 62% were females and 38% were males. Two-third of the participants was in the age range of 60–69 years. And 55% were Muslims and 45% were Hindus. While 35.8% were living in nuclear families and 97.75% were living with either spouse or children or other relatives. Majority of the elderly subjects were in socioeconomic class IV. And 61.75% were illiterate and 83.8% were unemployed [Table 1].

Their median depression score was 7.5 inter quartile range was 10 (IQR 10), ranging from a minimum of 2 to a maximum of 27. Of the 400 participants interviewed, 67 (16.75%) suffered from depression.

Geriatric depression had a significant association with illiteracy (OR = 2.2; 95%CI: 1.2–4.1), not doing any exercise (OR = 2.4; 95%CI: 1.03–5.3), sleeping less than 6 h (OR = 3.0; 95% CI: 1.7–5.1), and lesser leisure time spending with others (OR = 1.7, 95% CI: 1.02–2.9). On multivariate analysis, only the duration of sleep <6 h (AOR = 2.6; 95%CI: 1.4–4.6) was found significant which independently increased the risk of depression. Remaining all factors like sex, marital status, type of family, living condition, financial dependency, low socioeconomic status, illness in present and in past, habit of skipping meals, habit of taking breakfast, habit of smoking, alcohol consumption, or tobacco chewing were not found as significant risk factors for depression [Table 2].

DISCUSSION

There is a growing burden of mental morbidity in geriatric population worldwide.\[^{17}\] In this study, we found the prevalence of depression as 16.75%. This is a little higher than the depression estimated by Sengupta and Benjain in Ludhiana (8.9%)\[^{15}\] and Chauhan et al. in Telangana (9.3%).\[^{18}\] However, many researchers have also reported a higher prevalence of depression like 39.04% in Surat by Vishal et al.,\[^{15}\] 41.7% in Maharashtra by Goswami et al.\[^{19}\] and 42.7% in Tamil Nadu by Sinha et al.\[^{14}\] Various Indian studies have reported depression prevalence ranging from 6% to 62.2%.\[^{16,17}\] Barua et al., in a meta-analysis, reported a median prevalence of 21.9% for depression in India.\[^{13}\] The various reasons for the difference in estimates could be the use of different scales and sampling methods.
There was a significant association of depression with increasing age (Spearman’s correlation coefficient = 0.112, P = 0.026) and illiteracy (OR = 2.23, 95%CI (1.22-4.07)). While many researchers like Sengupta and Benjamin[5] Swarnalatha[20] Barua et al.[21] Rajkumar et al.[22] and Jain et al.[23] have reported similar risk of depression with increasing age, Papadopoulos et al.[24] showed no significant relationship between age and prevalence of depression. The association of depression with age can be due to organic diseases but can also be due to exogenous factors as advancing age is often accompanied by loss of social support systems due to the death of the spouse or siblings, retirement, or relocation of residence.[25]

Illiteracy was found to be an independent risk factor for depression on bivariate analysis (OR = 2.228,95%CI (1.22-4.07)) but not on multivariate analysis (AOR = 1.835,95% CI (0.91-3.68)). Others like Goyal et al.[26] and Jain and Aras[23] found that prevalence of depression was higher in illiterates (P < 0.05). A greater protective effect against mental disorders may be linked to higher education. Those from educated backgrounds are more likely to have healthy lifestyles and the resources to intellectually support them that promote mental health. Higher education can also be considered helpful in attaining more fulfilling careers and higher wages, thus leading to lower risk of depression. Education can be linked to better economic resources and a work environment that can mitigate financial stress, support healthy lifestyles, and hence promote mental health.[27]

### Table 2: Association of depression with various risk factors

| Variables                           | Depression absent (N=333)* | Depression present (N=67)* | Unadjusted odds ratio (95%CI)** | P value | Adjusted odds ratio (95% CI)† | P value |
|-------------------------------------|---------------------------|---------------------------|---------------------------------|---------|-----------------------------|---------|
| Female gender                       | 206 (61.9)                | 42 (62.7)                 | 1.036 (0.60-1.78)               | 0.89    | 0.967 (0.47-1.97)           | 0.93    |
| Widow/widower                       | 116 (34.8)                | 21 (31.3)                 | 0.854 (0.49-1.50)               | 0.58    | 3.461 (0.55-21.66)          | 0.19    |
| Nuclear family                      | 115 (34.5)                | 28 (41.8)                 | 1.361 (0.79-2.33)               | 0.26    | 1.219 (0.67-2.22)           | 0.52    |
| Living with spouse                  | 201 (60.4)                | 46 (68.7)                 | 1.439 (0.82-2.52)               | 0.20    | 5.292 (0.88-32.05)          | 0.07    |
| Illiterate                          | 196 (58.9)                | 51 (76.1)                 | 2.228 (1.22-4.07)               | 0.008   | 1.835 (0.91-3.68)           | 0.88    |
| Financially dependent               | 276 (82.9)                | 59 (88.1)                 | 1.523 (0.69-3.36)               | 0.29    | 1.301 (0.55-3.06)           | 0.55    |
| Low SES                             | 78 (23.4)                 | 9 (13.4)                  | 0.507 (0.24-1.07)               | 0.07    | 0.683 (0.29-1.57)           | 0.37    |
| Presence of current illness         | 166 (49.8)                | 31 (46.3)                 | 0.866 (0.51-1.47)               | 0.59    | 0.955 (0.53-1.71)           | 0.88    |
| Presence of past illness            | 35 (10.5)                 | 9 (13.4)                  | 1.321 (0.60-2.89)               | 0.49    | 1.358 (0.56-3.27)           | 0.49    |
| Skip meals                          | 75 (22.5)                 | 11 (16.4)                 | 0.676 (0.34-1.35)               | 0.27    | 0.828 (0.37-1.87)           | 0.65    |
| Do breakfast                        | 124 (37.2)                | 20 (29.9)                 | 0.717 (0.41-1.27)               | 0.25    | 0.983 (0.51-1.89)           | 0.96    |
| Don’t do any exercise               | 261 (78.4)                | 60 (89.6)                 | 2.364 (1.03-5.26)               | 0.04    | 1.953 (0.80-4.76)           | 0.14    |
| Habit of smoking                    | 17 (5.1)                  | 6 (9.0)                   | 1.828 (0.69-4.82)               | 0.25    | 1.688 (0.49-5.71)           | 0.39    |
| Habit of alcohol consumption        | 5 (1.5)                   | 1 (1.5)                   | 0.994 (0.11-8.65)               | 1       | 0.424 (0.03-5.82)           | 0.52    |
| Habit of tobacco chewing            | 40 (12.0)                 | 9 (13.4)                  | 1.137 (0.52-2.47)               | 0.75    | 1.130 (0.47-2.71)           | 0.78    |
| Duration of sleep <6 hours          | 82 (24.6)                 | 33 (49.3)                 | 2.971 (1.73-5.09)               | 0.00004 | 2.587 (1.44-4.64)           | 0.001   |
| Leisure time spending with others   | 143 (42.94)               | 38 (56.71)                | 1.742 (1.02-2.94)               | 0.04    | 1.594 (0.88-2.85)           | 0.12    |
| Time spent for leisure Activity <2 hours | 182 (54.7)               | 45 (67.2)                 | 1.697 (0.98-2.95)               | 0.059   | 1.789 (0.98-3.27)           | 0.058   |
| Skip meals                          | 75 (22.5)                 | 11 (16.4)                 | 0.676 (0.34-1.35)               | 0.27    | 0.828 (0.37-1.87)           | 0.65    |

*Figures in parentheses represent column-wise percentages. †Figures in parentheses represent 95% CI. CI: Confidence Intervals; SES: Socioeconomic status
Another important aspect would be the dose of exercise (duration) which may be the reason why the subjects in our study who reported doing exercise did not have a significantly lower depression.

Another important risk factor was a lack of adequate sleep. We found that depression was more among those who were having <6 h sleep at night (AOR = 2.587, 95% CI = 1.44–4.64). These results are supported by Dasgupta et al. [35] Paudel ML et al. [36] demonstrated that in community-dwelling older men, level of depressive symptoms had a strong, graded association with sleep disturbances. Livingston et al. [37] have also revealed that sleep disturbance was associated with current and future depression. Some researchers have also suggested that a diagnosis of depression in the absence of sleep complaints should be made with caution. Sleep disturbance is one of the key and often presenting symptom of depression. [38]

We did not find any significant association of depression with female gender, marital status, nuclear family, co-living, financial dependency, socioeconomic status, leisure time spending with others, current illness, eating habits, smoking, alcohol, or tobacco chewing.

A strength of the current study is the use of MDI tool for assessing depression, which covers the domains of Diagnostic and Statistical Manual of Mental Disorders (DSM IVth edition) [39] as well as International Classification of Diseases (ICD-10th revision) [40] for depression diagnosis and severity. It has a satisfactory Chronbach’s alpha of 0.89 [41] and has been shown to fulfill Mokken’s nonparametric item response theory and Rasch’s one parametric model, thus making it useful for unidimensional depression severity assessment [42] with good external and clinical validity. [43] However, MDI scale has been thought of as a relatively difficult questionnaire to understand, as it has a six point Likert scale. A simpler yes/no type of Geriatric Depression Scale (GDS) has been recommended for the elderly population, but it has more number of questions than the MDI. Moreover, the GDS is considered inaccurate in the presence of cognitive decline and for extreme age groups. [43]

Although we tried to ensure the privacy of the interviewees, this was difficult in the small houses with joint families due to which the elderly participants might have guarded their opinions. Also, social desirability bias could have resulted in an underestimation of depression prevalence.

**CONCLUSIONS**

The prevalence of depression was high in the urban elderly population of Northern India. Depression increased with increasing age and reducing sleep time. Identification of risk factors for depression among elderly population and using those factors to identify the individuals at higher risk for depression can help the health care providers to plan for the better care of the elderly and reduce the frequency and severity of the occurrence of depression among them.

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**Conflicts of interest**

There are no conflicts of interest.

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