# PREVALENCE AND FACTORS AFFECTING DEPRESSION AMONG ELDERLY IN MANGALORE

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**Keywords**

Depression, Geriatric Depression, Mangalore, Prevalence, Risk factors

**Abstract**

**Introduction:** The prevalence of depression is very high in elderly with a pattern of silent epidemic. A rise in the geriatric population is projected to increase the burden of depression.

**Objectives:** To assess the prevalence of depression and to determine the factors affecting depression among elderly in Mangalore city.

**Materials and Methods:** A cross-sectional study was conducted among 113 elderly people with age of 65 years and above residing in Mangalore city. The data was collected using pretested and semi-structured proforma and validated Geriatric Depression Scale (GDS-15) questionnaire. The Chi square test/Fishers exact test was used to study the association between the study variables and the magnitude of depression. Binary logistic regression model was fitted to identify the risk factors associated with depression.

**Results:** The prevalence of depression was determined to be 64.4% among the study participants. Out of which 42.5% had mild depression, 17.7% had moderate and 4.4% had severe depression. Middle old age group, presence of comorbidities such as diabetes mellitus, hypertension and musculoskeletal disorders, economic dependency were identified as the significant risk factors associated with depression among elderly.

**Conclusion:** The prevalence of depression among elderly is high (64.4%). Therefore, early detection and management of depression in elderly is deemed crucial.

## Introduction

Depression is a disorder of major public health importance, in terms of its prevalence and the suffering, dysfunction, morbidity and economic burden.[1] It is a psychiatric disorder that affected 3.8 percent of the global population.[2] Depression is common among elderly population in India.[3] Elderly population, defined as persons with age of above 60 years,[4] is steadily increasing in India.[5] On the basis of the result of 2011 census, the population of elderly is projected to go above 10% by 2020.[6] Depression among elderly is not taken seriously, thus remains under-diagnosed[7] because this occurs in conjunction with other age-related issues.[8] Lack of funding, a shortage of skilled health-care practitioners and the societal

stigma associated with mental illnesses are all obstacles to effective treatment.[9] Poor quality of life and worsening of age related chronic diseases may result in increased suicide mortality among the elderly with depression.[10] There is a need for early detection and social control of depression among these high-risk individuals, which would be extremely beneficial for their quality of life. Therefore, the present study aimed to assess the prevalence of depression and to determine the factors affecting depression among elderly in Mangalore city.

**Material and methods:**

A cross sectional study was conducted among the elderly population above the age of 65 years visiting tertiary care hospital. The study was carried out from August to December 2022 after obtaining the Intuitional Ethics committee (KIMS/IEC/A003/2022).

Individuals residing in old age homes, having difficulty in communication, critically ill and having any prior psychiatric illness were excluded from the study. The Sample size (n) was estimated using the formula $n = Z^2_{\alpha}pq/d^2$. The prevalence (p) of severe depression among geriatric population was 7% [11] with 95% confidence interval, an allowable error (d) of 5% and non-response rate of 10%. The final sample size estimated for the study was 113. The elderly population of either sex visiting the tertiary care hospital were approached. After explaining the study procedure, written informed consent was obtained from willing participants. The participants were asked the questions as per the contents of the study tool and their responses were noted.

**Study Tool**

The questionnaire consisted of two parts. Part A was semi-structured proforma consisting of details on socio-demographic characteristics. Additionally, economic dependence, daily activities dependence and comorbidities were also assessed. Part B consisted of validated Geriatric Depression Scale (GDS-15) questionnaire.[12] It is a self-reported instrument originally developed by Yesavage et.al in 1986, for the assessment of depression among the geriatric population. It consists of 15 close-ended questions with yes/no responses. An elderly with score of 0-4 was considered to be normal while with a score of ≥ 5 was considered to be depressed. Depressed score is sub categorized as Mild depression (5-8), Moderate depression (9-11) and severe depression (12-15).

**Operational Definitions**

*Elderly*: Elderly were defined as the individuals with age at minimum of 65 years. The study participants were grouped into three age categories such as youngest old ranging between 65 to 74 years, middle old ranging between 75 to 84 years and oldest old being ≥ 85 years.[13]
*Economically Independent*: Elderly leading economically productive life were considered as 'Economically Independent'. Elderly with small income like old age pension were considered as 'Partly dependent' and if they were not having any income they were considered as 'dependent'.[13] *Activities of daily living*: Elderly who would do household work regularly or involve in agriculture or any other kind of work were considered as 'Independent'. Elderly who depends on others for daily activities were considered as 'Partly dependent' and if they were not unable to conduct their daily activities on their own and always required help from others were considered as 'dependent'.[13]

**Data Analysis**

Data collected was entered into Microsoft Excel and analysed using SPSS version 28. Descriptive statistics were presented as frequency and percentage for categorical variables. Chi square test/Fishers exact test was used to study the association between the study variables and the magnitude of depression. For the associated factors found in Chi square test, binary logistic regression model was fitted to identify the risk factors associated with depression. The adjusted odds ratio with 95 percent confidence interval was calculated. The model fitness was evaluated

using Hosmer-Lemshow goodness of fit. The p value < 0.05 was considered to be statistically significant throughout the analysis.

**Results**

Out of 113 elderly, 69% were youngest old belonging to age group 65 to 74 years, 45.1 % were males, 31.9% were illiterate, 3.5% were graduates, 46.9% were living in a nuclear family, 43.4% in joint families and 18.6% were below the poverty line. 62.8 % were economically independent, 10.6% were dependent to perform their daily activities (Table 1). Considering the comorbidities, 50.4% had diabetes mellitus, 36.3% had hypertension and 43.4% had musculoskeletal disorder (Table 2).

The present study showed that 23.0% were not satisfied with their life, 48.7 % had dropped the activities of their interest, 30.1 % felt that their life was empty, 39.8 % often got bored, 70.8 % were not in a good mood most of the time, 31.0 % were afraid that something bad is going to happen to them, 61.1 % didn't feel happy most of the time and 33.6% felt helpless,71.7 % preferred to stay at home, 37.2% felt they have problem with memory, 68.1% thought it's not good to be alive ,56.6 % felt they are worthless, 53.1% felt that they don't have energy, 31.0 % felt hopeless and 36.3% felt that most of the other people of their age group are better off than them. In figure 1, the prevalence of depression was found to be 64.6% out of which, 42.5% had mild depression, 17.7% had moderate and 4.4% had severe depression.

The present study showed that middle old age group of 75-84 years (p value=0.010), presence of comorbidities such as Diabetes mellitus (p value=0.0001), Hypertension (p value=0.0001) and Musculoskeletal disorder (p value=0.0001) as well as partial economic dependence (p value=0.045) had a statistically significant association with depression (Table 3). However, depression had no significant association with sex, education level, type of family, possession of ration card and dependence on daily activities.

Middle old age group were 8.90 times more likely to develop depression compared to their counterpart. The study found that study participants with diabetes mellitus and hypertension were 6.54 and 77.71 times respectively, more likely to develop depression. Further study reveals that the elderly who were partly economically dependent were 2.72 times and who were completely dependent were 4.30 times more likely to develop depression compared to those who were independent (Table 4).

**Discussion**

In the present study the prevalence of depression was found to be 64.6 %. Previous studies on prevalence of depression among elderly gave indecisive results. In an earlier meta-analysis, the prevalence of depression among elderly was reported as 35.1% and this was reported to be the same as the prevalence in India based on earlier meta-analysis but higher than in China .[14] The current study findings were similar (67.5%) with the study conducted in Tamilnadu.[10] The prevalence of our study was comparatively higher than earlier studies conducted in the tribal area of Maharashtra (13%), slum area of Mumbai (42%), Rajkot City of Gujarat (32.2%) and Haryana (22.72%) .[15-18] This disparity might be due to the difference in cultural background. Varied measuring criteria and different definitions used by different researchers may also be another reason for a widely different observation of prevalence of depression.[19]

In the present study depression was found to be associated with age, economic dependence, presence of comorbidities such as diabetes mellitus, hypertension and musculoskeletal disorders. These results were consistent with the observations done by Chauhan P et al.[9] In the present study sex, education level, type of family, possession of ration card and dependence on daily activities had no significant association with depression. However, in earlier studies, a different observation was obtained, where females had a statistically significant association with depression.[16,20] An earlier Indian study also reported a higher degree of depression among elderly who are physically dependent for daily activities.[8] At this juncture, an earlier study showed that the prevalence of depression was statistically higher among nuclear family

residents.[18] The present study showed that the population of middle old age group (75-84yeras) were 8.907 times more likely to develop depression compared to youngest old and oldest old. In this regard, an earlier study revealed that age between 70 to 79 years have 1.36 higher risk and higher age (80 years and above) have 2.03 times higher risk of developing depression.[20] Prevalence of depression was found to increase with age in earlier findings.[3,21]
The present study found that study participants with diabetes mellitus are 6.54, hypertension are 77.71 times more likely to have depression respectively. Earlier study outcomes gave a picture where the comorbidities were not specified and the elderly having comorbidities were 1.54 times and 2.4 times more likely to have depression respectively.[13,20]The relationship between chronic comorbidities and depression is bidirectional.[22] In support of this statement, an earlier study conducted at Maharashtra gave the result of elderly with depression being 1.38 times more likely to have diabetes mellitus, 1.14 likely to have hypertension and 1.03 times likely to have musculoskeletal disorder.[16] The higher risk of diabetes mellitus and hypertension among elderly was seen in our study.
The study showed that, elderly who are partly economically dependent were 2.72 times and who were completely dependent were 4.30 times more likely to have depression compared to those who were independent. The similar results were reflected in the study done by Akhtar et al., where 2.49 times higher risk among the elderly who were dependent for financial support.[20] In this context, higher degree of depression was observed among elderly in lower and middle income countries.[23] The worry about financial dependence on others for daily requirements, lower income and health-care bills were the reasons. Financial dependency may result in decreased availability of proper treatment for physical ailments, thereby aggravating depression among elderly. In this regard, provision of financial support for elderly in the form of pension was suggested by earlier authors.[8] Many elderly people might have been helped by the availability of generic medicines for a reasonable price.
The present study had few limitations. The samples were drawn from a single urban area, this limits the study's generalizability. Chronic morbidities were either pre-diagnosed or were self-reported. As a result, some chronic comorbidities, such as undetected hypertension and diabetes mellitus may have been overlooked.

**Conclusion**

Depression is very high in elderly with a pattern of silent epidemic. The prevalence is quite high among the elderly (64.4%). Middle old age group, presence of comorbidities such as diabetes mellitus, hypertension and musculoskeletal disorder, economic dependence were identified as the significant risk factors affecting elderly. Special consideration should be taken among the elderly who are depressed. Thus, the study discovers the need to raise awareness among family members and the community about how to recognise depression early and seek appropriate counselling and treatment.

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**Tables:**

**Table 1: Socio-demographic details of the study participants**

| Study variables | Frequency (%) (n=113) |
|---|---|
| Age groups (in years) | |
| Youngest old (65-74) | 78 (69.0) |
| Middle old (75-84) | 25(22.1) |
| Oldest old (≥ 85) | 10(8.9) |
| Sex | |
| Male | 51(45.1) |
| Female | 62(54.9) |
| Education level | |
| Illiterate | 36(31.9) |
| Primary | 35(31.0) |
| Highschool | 30(26.5) |
| Pre university | 8(7.1) |
| Graduates | 4(3.5) |
| Type of family | |
| Nuclear | 53(46.9) |
| Joint | 49(43.4) |
| Three generation | 11(9.7) |
| Ration card | |
| BPL | 21(18.6) |
| APL | 92(81.4) |
| Economic dependence | |
| Independent | 71(62.8) |
| Partly dependent | 19(16.8) |
| Dependent | 23(20.4) |
| Activities of daily living | |
| Independent | 56(49.6) |
| Partly dependent | 45(39.8) |
| Dependent | 12(10.6) |

**Note: N(%) is reported**

**Table 2: Comorbidities among the study participants**

| **Comorbidities** | **Frequency (%) (n=113)** |
|---|---|

| | |
|---|---|
| Diabetes mellitus | 56(50.4) |
| Hypertension | 41(36.3) |
| Musculoskeletal disorder | 49(43.) |

Note: N(%) is reported

**Figure 1: Prevalence of depression among study participants**

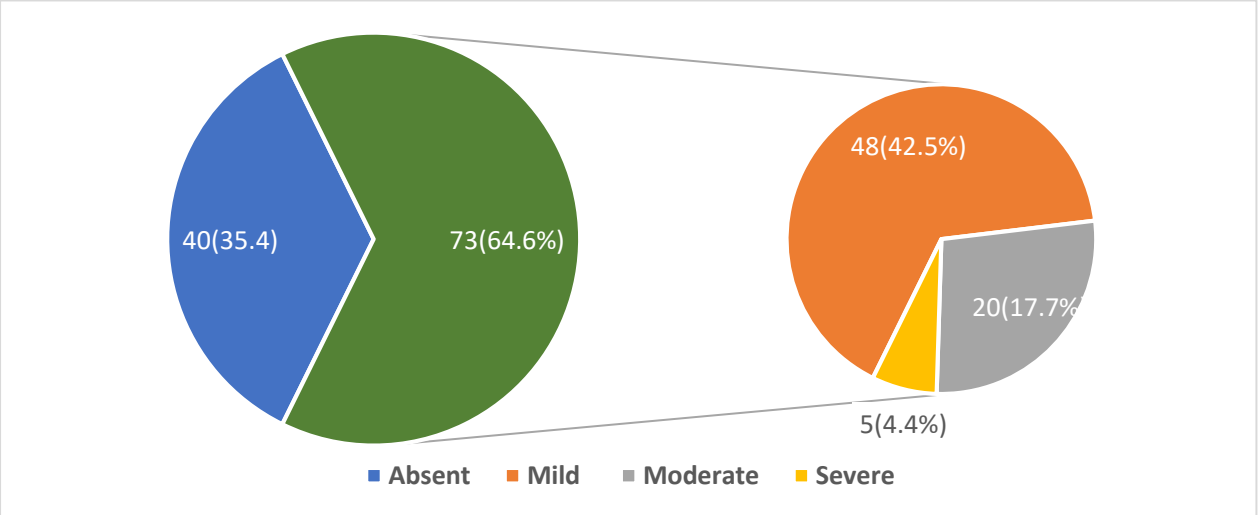


**Table 3: Association between age, comorbidities, economic dependency and depression among study participants**

| Study variables | | Depression | | Chi square value/fisher exact | ‡P value |
|---|---|---|---|---|---|
| | | Present (n=73) | Absent (n=40) | | |
| Age groups | Youngest old | 47(60.3) | 31(39.7) | 9.276 † | 0.010* |
| | Middle old | 22(88.0) | 3(12.0) | | |
| | Oldest old | 4(40.0) | 6(60.0) | | |
| Diabetes mellites | Absent | 25(43.9) | 32(56.1) | 21.639 † | 0.0001* |
| | Present | 48(85.7) | 8(14.3) | | |
| Hypertension | Absent | 33(45.8) | 39(54.2) | 30.297‡ | 0.0001* |
| | Present | 40(97.6) | 1(2.4) | | |
| Musculoskeletal disorder | Absent | 31(48.4) | 33(51.6) | 16.864 † | 0.0001* |
| | Present | 42(85.7) | 7(14.3) | | |
| Economic dependence | Independent | 40(56.3) | 31(43.7) | 6.187 † | 0.045* |
| | Partly dependent | 16(84.2) | 3(15.8) | | |
| | Dependent | 17(73.9) | 6(26.1) | | |

***p value <0.05 is statistically significant; †Chi square test; ‡fisher exact test**

**Table 4: Binary logistic regression for depression among its associated variables**

| Variables | Adjusted Odds ratio | 95% C.I. for odds ratio | | p value |
|---|---|---|---|---|
| | | Lower | Upper | |
| **Age groups** | | | | |
| Youngest old | Reference | | | |

| | | | | |
|---|---|---|---|---|
| Middle old | 8.90 | 1.816 | 43.675 | 0.007* |
| Oldest old | 0.16 | 0.013 | 2.151 | 0.169 |
| **Diabetes mellites** | | | | |
| Absent | Reference | | | |
| Present | 6.54 | 1.947 | 21.988 | 0.002* |
| **Hypertension** | | | | |
| Absent | Reference | | | |
| Present | 77.71 | 4.847 | 1246.019 | 0.002* |
| **Musculoskeletal disorder** | | | | |
| Absent | Reference | | | |
| Present | 1.56 | 0.426 | 5.714 | 0.502 |
| **Economic dependence** | | | | |
| Independent | Reference | | | |
| Partly dependent | 2.72 | 0.402 | 18.514 | 0.305 |
| Dependent | 4.30 | 1.039 | 17.822 | 0.044* |
| Depression= Age groups+ Diabetes mellitus+ Hypertension+ Musculoskeletal disorder+ Economic dependency<br>Model fitness: Hosmer Lemeshow Goodness of fitness (p value = 0.776)<br>C.I.: Confidence interval<br>*p value <0.05 is statistically significant | | | | |