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# PREVALENCE AND SOCIO-DEMOGRAPHIC CORRELATES OF DEPRESSION AMONG ELDERLY WOMEN IN RURAL COIMBATORE, TAMIL NADU: A CROSS-SECTIONAL STUDY

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ABSTRACT

**Background:** The intersection of gender, aging, and rural isolation exposes elderly women in developing nations to a high risk of psychiatric morbidity, yet localized data remains scarce. **Aims and Objectives:** To determine the prevalence of depression among elderly women in rural Coimbatore, Tamil Nadu, and identify its independent socio-demographic and health predictors.
**Materials and Methods:** A community-based, cross-sectional study was conducted among 150 elderly women (age ≥60 years) using multi-stage random sampling. Data on socio-demographic factors, co-morbidities, and functional status were collected using a pre-tested interview schedule. Depression was screened via the validated Geriatric Depression Scale-Short Form (GDS-15).
**Results:** The prevalence of geriatric depression was 41.3% (95% CI: [33.4%, 49.3%]). On multivariate logistic regression, living alone emerged as the strongest independent risk factor (AOR = 4.35, p = 0.001), followed by complete financial dependency (AOR = 2.84, p = 0.019), functional disability (AOR = 3.12, p = 0.006), and the presence of chronic co-morbidities (AOR = 2.31, p = 0.041).
**Conclusion:** Late-life depression is a major public health challenge among rural women. Addressing this hidden epidemic requires integrating targeted geriatric mental health screenings into primary healthcare frameworks.
**Keywords:** Depression; Aged; Women; Rural Population; India; Cross-Sectional Studies.

## INTRODUCTION

The global population is undergoing an unprecedented demographic transition characterized by a rapidly aging populace, a phenomenon most pronounced in developing nations.[1] India is at the forefront of this shift; demographic projections suggest that the country's elderly population (aged 60 years and older) will double to constitute nearly 20% of the total population by mid-century.[2]
While this transition reflects major achievements in public health and socio-economic development, it simultaneously imposes a formidable burden on healthcare systems, particularly concerning mental health. Among the psychiatric morbidities prevalent in late life, depression stands out as a pervasive yet chronically underdiagnosed and undertreated public health challenge.[3]
Late-life depression is a multifactorial disorder resulting from a complex interplay of biological, psychological, and social vulnerabilities. It significantly impairs the quality of life, exacerbates co-existing chronic physical illnesses, and increases mortality risks, including suicide.[4] Within the aging demographic, elderly women represent a uniquely vulnerable subset. Globally and nationally, older women consistently exhibit higher rates of

depressive disorders compared to their male counterparts.[5]

Gender disparity is rooted in a matrix of socio-biological vulnerabilities. Women generally experience greater longevity but face higher rates of chronic disability, lower literacy rates, and lifelong financial dependence.[6] In the Indian societal fabric, the intersection of gender and aging often manifests as widowhood, loss of the traditional matriarchal role in nuclearizing families, and socio-economic marginalization, all of which are potent triggers for psychological distress.[7]

The vulnerability of elderly women is profoundly magnified in rural geographies. Rural regions in India house the vast majority of the geriatric population, yet they are structurally disadvantaged by a severe maldistribution of healthcare infrastructure.[8] Rural elderly women frequently endure the "triple jeopardy" of ageism, sexism, and rural isolation. In these settings, agrarian distress, outward migration of younger generations to urban centers for employment, and the gradual erosion of the traditional joint family system leave older women lacking essential physical, emotional, and financial support systems.[9] Furthermore, pervasive mental health stigma, low health literacy, and a lack of accessible psychiatric services mean that depressive symptoms in rural areas are frequently dismissed as normal correlates of aging rather than treatable clinical conditions.[10]

The state of Tamil Nadu, despite boasting some of India's most advanced health indicators, exhibits distinct regional disparities between its urban economic hubs and rural hinterlands. The rural pockets of the Coimbatore district present a critical environment for investigation. While Coimbatore is highly industrialized, its rural peripheries remain heavily reliant on agrarian economies and are subject to rapid socioeconomic transitions that alter family structures. While fragmented literature exists on geriatric mental health in urban centers, localized, gender-disaggregated data focusing specifically on the psychological well-being of rural elderly women in this region remains sparse.

By evaluating the prevalence and identifying the socio-demographic determinants of depression among elderly women in rural Coimbatore, this cross-sectional study aims to provide actionable insights for public health policymakers, local health administrators, and clinicians to mitigate the silent epidemic of late-life depression in rural Tamil Nadu.

## MATERIALS AND METHODS

**Study Setting:** This community-based, cross-sectional study was conducted in the rural peripheries of the Coimbatore district, Tamil Nadu, India. The study was carried out over a period of six months, from October 2025 to March 2026. Coimbatore district features a diverse demographic split across 12 revenue blocks; for this investigation, the field areas were strictly restricted to randomly selected, rural primary health center (PHC) catering zones to capture the specific socio-demographic dynamics of the rural geriatric population.

**Study Participants:** The study population comprised elderly women residing in the chosen rural blocks of Coimbatore. To be included in the study, participants had to be female, aged 60 years or older at the time of the survey, and permanent residents who had lived in the selected village for at least one year prior to data collection. We excluded individuals with severe cognitive impairment or advanced dementia—screened initially via a mini-mental status examination—as well as those with profound uncorrected hearing or speech impediments that precluded a standard interview. Elderly women who were critically ill, bedridden, or otherwise unable to tolerate a 30-minute interview were also excluded from the sample.

**Sample Size and Sampling Technique:** The sample size was estimated based on the standard single proportion formula. Factoring in regional prevalence data of late-life depression and adjusting for field precision and potential non-response rates, the final sample size was optimized and fixed at 150 participants.

A multi-stage random sampling technique was utilized to recruit participants. In the first stage, two rural blocks within the Coimbatore district were randomly selected via a lottery method. In the second stage, three villages were selected from each of the two blocks using probability proportional to size (PPS) sampling. In the final stage, a systematic house-to-house survey was executed within the selected villages. A random starting point was chosen in each village, and households were sequentially visited to screen for eligible elderly women until the required quota of 150 participants was completed.

**Study Tools:** Data collection was facilitated using a pre-tested, structured interview questionnaire translated and linguistically validated in Tamil (the local vernacular). The tool comprised three primary blocks:

- **Socio-Demographic Questionnaire:** Formulated to collect data on age, formal education, marital status, living arrangements (alone vs. with family), financial independence, and socioeconomic stratum as defined by the modified BG Prasad classification.
- **Health and Functional Profile:** A checklist documenting self-reported chronic co-morbidities (such as hypertension, diabetes, and osteoarthritis) alongside a validated Activities of Daily Living (ADL) scale to grade functional independence.
- **Geriatric Depression Scale (GDS-15):** The short-form version consisting of 15 binary (yes/no) questions specifically validated for screening depressive symptoms in older populations. A diagnostic cut-off score of ≥ 5

was utilized to classify the presence of depression.

**Study Procedure:** Data collection was executed through face-to-face, door-to-door interviews conducted by trained clinical investigators at the participants' residences. This approach guaranteed a private, familiar, and non-threatening environment for the subjects. Before commencing, the investigators explained the purpose of the study in lay terms. On average, each interview required 20 to 30 minutes. To maintain standard quality assurance, all filled questionnaires were reviewed daily for completeness and internal consistency by the principal investigator.

**Ethical Issues:** The study protocol was approved by the Institutional Ethics Committee (IEC). Prior to administrative screening, voluntary written informed consent—or a witnessed thumb impression for illiterate participants—was obtained from each individual. The participants were explicitly informed of their right to withdraw from the interview. Participants identified with moderate-to-severe depressive symptoms or urgent clinical co-morbidities were formally referred to the nearest public primary health center or tertiary care hospital for psychiatric and medical care.

**Statistical Analysis:** Data were checked for entry errors, coded, and analyzed using SPSS version 25.0. Continuous variables (such as age) were reported as mean ± standard deviation (SD), while categorical distributions (such as socioeconomic classes, presence of co-morbidities, and depression prevalence rates) were expressed as frequencies and percentages. Bivariate analysis was performed using the Chi-square test to identify significant associations between categorical independent variables and the presence of depression. Variables demonstrating statistical significance at a level of $p < 0.05$ were subsequently entered into a multivariate logistic regression model. Adjusted odds ratios (AOR) along with their corresponding 95% confidence intervals (CI) were calculated to determine the independent socio-demographic predictors of depression among the study cohort.

## RESULTS

A total of 150 rural elderly women participated in the study, resulting in a 100% response rate. The mean age of the participants was 68.4 years (SD = 5.2). Most participants belonged to the 60–69 years age group (65.3%). More than half were illiterate (58.0%) and widowed or deserted (54.0%). Most women lived with their children or family members (58.7%), whereas 22.7% lived alone. Nearly seven in ten participants belonged to the lower socioeconomic class (Classes IV and V) according to the Modified BG Prasad classification, and 64.7% reported complete financial dependency. [Table 1]

**Table 1: Socio-Demographic Characteristics of Rural Elderly Women (N = 150)**

| Variable | Category | N | % |
|---|---|---|---|
| **Age group (years)** | 60–69 | 98 | 65.3 |
| | 70–79 | 38 | 25.3 |
| | ≥80 | 14 | 9.4 |
| **Educational status** | Illiterate | 87 | 58.0 |
| | Primary school | 43 | 28.7 |
| | Middle school and above | 20 | 13.3 |
| **Marital status** | Currently married | 69 | 46.0 |
| | Widowed/Deserted | 81 | 54.0 |
| **Living arrangement** | Living with spouse | 28 | 18.7 |
| | Living with children/family | 88 | 58.7 |
| | Living alone | 34 | 22.7 |
| **Socioeconomic status** | Upper/Upper middle (Class I & II) | 12 | 8.0 |
| | Middle (Class III) | 34 | 22.7 |
| | Lower middle/Lower (Class IV & V) | 104 | 69.3 |
| **Financial independence** | Completely independent | 21 | 14.0 |
| | Partially independent | 32 | 21.3 |
| | Completely dependent | 97 | 64.7 |

*Note. Mean age = 68.4 years (SD = 5.2). Socioeconomic status classified using the Modified BG Prasad Scale.*

The majority of participants (72.0%) had at least one chronic medical condition. Osteoarthritis or chronic joint pain (52.7%) was the most commonly reported morbidity, followed by hypertension (42.7%) and diabetes mellitus (20.7%). Functional assessment demonstrated that 64.0% of participants were independent in activities of daily living (ADL), whereas 36.0% required either partial or complete assistance. [Table 2]

**Table 2: Clinical and Functional Profile of the Study Participants (N = 150)**

| Health indicator | Category | n | % |
|---|---|---|---|
| **Presence of co-morbidities** | Absent | 42 | 28.0 |
| | Present (≥1 illness) | 108 | 72.0 |
| **Specific conditions*** | Osteoarthritis/Joint pain | 79 | 52.7 |
| | Hypertension | 64 | 42.7 |
| | Diabetes mellitus | 31 | 20.7 |

| | | | |
|---|---|---|---|
| | Cardiovascular disease | 11 | 7.3 |
| **Activities of Daily Living (ADL)** | Independent | 96 | 64.0 |
| | Partially dependent | 39 | 26.0 |
| | Completely dependent | 15 | 10.0 |

*Note. Percentages for specific conditions exceed 100% because participants could report multiple co-morbidities.*

Based on the Geriatric Depression Scale–15 (GDS-15), the overall prevalence of depression was 41.3% (95% CI [33.4%, 49.3%]). Most participants (58.7%) had normal GDS scores. Among those with depression, 24.7% had mild depression, whereas 16.6% had moderate-to-severe depressive symptoms.

**Table 3: Prevalence and Severity of Depression According to GDS-15 (N = 150)**

| GDS-15 score | Clinical interpretation | n | % | 95% CI |
|---|---|---|---|---|
| 0–4 | Normal/No depression | 88 | 58.7 | [50.7%, 66.6%] |
| 5–9 | Mild depression | 37 | 24.7 | [17.8%, 31.6%] |
| 10–15 | Moderate to severe depression | 25 | 16.6 | [10.6%, 22.6%] |
| ≥5 | Overall depression prevalence | 62 | 41.3 | [33.4%, 49.3%] |

*Note. Depression was defined as a GDS-15 score ≥5.*

Chi-square analysis identified several factors significantly associated with depression. Depression prevalence increased significantly with advancing age ($\chi^2$ = 15.34, p < .001). Higher rates of depression were also observed among women who were widowed or deserted, lived alone, were financially dependent, had chronic co-morbidities, or were dependent in activities of daily living. Educational status was not significantly associated with depression. [Table 4]

**Table 4: Bivariate Association Between Participant Characteristics and Depression (N = 150)**

| Variable | Category | Depression Present n (%) | Depression Absent n (%) | $\chi^2$ | p |
|---|---|---|---|---|---|
| **Age group** | 60–69 | 30 (30.6) | 68 (69.4) | 15.34 | <.001 |
| | 70–79 | 21 (55.3) | 17 (44.7) | | |
| | ≥80 | 11 (78.6) | 3 (21.4) | | |
| **Educational status** | Illiterate | 41 (47.1) | 46 (52.9) | 3.52 | .172 |
| | Primary and above | 21 (33.3) | 42 (66.7) | | |
| **Marital status** | Currently married | 19 (27.5) | 50 (72.5) | 8.84 | .003 |
| | Widowed/Deserted | 43 (53.1) | 38 (46.9) | | |
| **Living arrangement** | With spouse/family | 38 (32.8) | 78 (67.2) | 18.21 | <.001 |
| | Living alone | 24 (70.6) | 10 (29.4) | | |
| **Financial dependency** | Independent/Partial | 11 (20.8) | 42 (79.2) | 17.65 | <.001 |
| | Completely dependent | 51 (52.6) | 46 (47.4) | | |
| **Co-morbidities** | Absent | 10 (23.8) | 32 (76.2) | 6.27 | .012 |
| | Present | 52 (48.1) | 56 (51.9) | | |
| **ADL status** | Independent | 26 (27.1) | 70 (72.9) | 21.04 | <.001 |
| | Dependent | 36 (66.7) | 18 (33.3) | | |

*Note. $\chi^2$ = Pearson chi-square statistic. Statistically significant values are p < .05.*

Variables that were statistically significant in the bivariate analysis were entered into a binary logistic regression model. The model demonstrated good fit, Hosmer–Lemeshow $\chi^2(8)$ = 6.12, p = .634, with Nagelkerke $R^2$ = .418. Living alone was the strongest independent predictor of depression (AOR = 4.35, 95% CI [1.78, 10.62], p = .001). Complete financial dependency, ADL dependency, chronic co-morbidities, and age ≥80 years also independently increased the likelihood of depression. Marital status was no longer statistically significant after adjustment.

**Table 5: Multivariate Logistic Regression Analysis of Independent Predictors of Depression (N = 150)**

| Predictor | β | SE | AOR | 95% CI | p |
|---|---|---|---|---|---|
| **Age group (Ref: 60–69 years)** | | | | | |
| 70–79 years | 0.62 | 0.41 | 1.86 | [0.83, 4.15] | .131 |
| ≥80 years | 1.25 | 0.55 | 3.48 | [1.18, 10.24] | .024 |
| **Marital status (Ref: Married)** | | | | | |
| Widowed/Deserted | 0.43 | 0.42 | 1.54 | [0.67, 3.51] | .304 |
| **Living arrangement (Ref: With family)** | | | | | |
| Living alone | 1.47 | 0.46 | 4.35 | [1.78, 10.62] | .001 |
| **Financial dependency (Ref: Independent/Partial)** | | | | | |
| Completely dependent | 1.04 | 0.44 | 2.84 | [1.19, 6.78] | .019 |
| **Co-morbidities (Ref: Absent)** | | | | | |
| Present | 0.84 | 0.41 | 2.31 | [1.03, 5.16] | .041 |
| **ADL status (Ref: Independent)** | | | | | |

| | | | | | |
|---|---|---|---|---|---|
| Dependent | 1.14 | 0.41 | 3.12 | [1.39, 6.98] | .006 |
| Constant | –2.41 | 0.68 | 0.09 | — | <.001 |

*Note. AOR = adjusted odds ratio; CI = confidence interval; Ref = reference category. Model fit: Hosmer–Lemeshow $\chi^2(8) = 6.12$, $p = .634$; Nagelkerke $R^2 = .418$. Statistically significant predictors are those with $p < .05$.*

## DISCUSSION

This community-based, cross-sectional study offers critical insights into the psychiatric workload prevailing among elderly women residing in rural Coimbatore, Tamil Nadu. By evaluating a focused cohort of 150 older women using the culturally validated Geriatric Depression Scale-Short Form (GDS-15), we uncovered a substantial public health challenge, with 41.3% ($n = 62$) screening positive for depressive symptoms. Of heightened clinical concern is the stratification of severity: while 24.7% experienced mild symptoms, a striking 16.6% manifested moderate-to-severe depression. This high localized prevalence reflects an intersection of demographic vulnerabilities, including systemic socio-economic deprivation, rising structural isolation, and a heavy burden of physical chronic co-morbidities that characterize the lives of aging women in rural south Indian communities.

The overall depression prevalence of 41.3% reported in this investigation stands in close alignment with wider epidemiological trends documented across rural India. Our findings are highly consistent with a regional study conducted in rural Tamil Nadu by Malai Ammal et al,[11] which recorded a depression prevalence of 42.8% among the rural elderly. Similarly, research executed in neighboring rural geographies, such as a community survey among older women in rural Mandya, Karnataka, documented a comparable burden of 31.6%.[12]

However, our observed prevalence is considerably higher than figures reported from several urban settings, such as a study among slum dwellers in Chennai that noted a baseline prevalence of 17%.[13] This pronounced urban-rural discrepancy can be attributed to the "triple jeopardy" confronting rural elderly women. In modernizing rural hubs like the outer peripheries of Coimbatore, rapid industrialization running parallel to agricultural volatility has accelerated the migration of younger generations to urban centers.

Multivariate logistic regression analysis in this study confirmed that social isolation, quantified as living alone, was the single strongest independent predictor of late-life depression (AOR = 4.35, 95% CI: 1.78, 10.62, p = 0.001). Sociological shifts across rural Tamil Nadu are systematically dismantling the joint family system, transitioning rural communities toward nuclear household models. For an elderly woman, living alone represents not only physical isolation but a profound loss of structural value, emotional validation, and localized security within the household. Contemporary literature strongly substantiates this vulnerability; a cross-sectional study in rural Odisha by Antony et al,[14] reported that living with children functioned as a potent protective factor against psychiatric morbidity, whereas solitary living setups uniquely multiplied the risk of clinical depression.

Our analysis highlighted complete financial dependency as a prominent independent economic predictor of depression (AOR = 2.84, p = 0.019). In our cohort, a striking 64.7% of women reported absolute financial reliance on others. Within the agrarian social matrix of rural south India, lifelong structural disparities—including low female literacy rates (58.0% in our sample), a lack of formal vocational avenues, and historical exclusion from land ownership—ensure that women arrive at old age without personal economic cushions or personal assets.

When an older woman is forced to depend entirely on family members for basic daily survival and medical expenditures, it often generates a profound sense of being an operational burden. This perceived dependency diminishes autonomy, precipitates interpersonal friction within the household, and fuels the persistent stress that drives depressive pathways. This dynamic has been consistently highlighted across pan-Indian geriatric literature, with multi-centric reviews underscoring economic dependency as a core driver of mental distress in late life.[15]

The link between physical and psychological breakdown was vividly illustrated in our study by the independent predictive weight of chronic co-morbidities (AOR = 2.31) and functional dependency in activities of daily living (AOR = 3.12, p = 0.006). Over 72% of our participants suffered from at least one chronic somatic disease, with osteoarthritis and chronic joint pain dominating the clinical profile (52.7%).

In rural landscapes, where physical mobility is a prerequisite for executing daily tasks, fetching water, and maintaining social connections, musculoskeletal pain and cardiovascular restrictions severely clip an individual's operational sphere. The resultant functional restriction impairs autonomy, induces chronic pain states, and fosters helplessness, acting as a biological and psychological trigger for depressive episodes. This bidirectional relationship between physical multi-morbidity, functional impairment, and late-life depression is heavily documented in contemporary national surveys, emphasizing that physical and mental health cannot be treated in isolation.[16]

While marital status (widowhood or desertion) showed a significant raw association during bivariate assessment (p = 0.003), its statistical significance was completely attenuated in the

multivariate logistic regression model. This finding suggests that widowhood does not act as an isolated biological driver of depression; rather, its pathological impact is mediated through the practical, downstream vulnerabilities it creates, such as sudden shifts into solitary living arrangements and acute financial dependency.

This study possesses distinct strengths, including its community-based sampling approach and the deployment of the validated GDS-15 instrument, which circumvents the somatic masking common in geriatric assessments. However, several limitations must be acknowledged. First, the cross-sectional design inherently precludes establishing definitive causal relationships between the identified risk factors and the onset of depression. Second, because data collection relied on self-reported clinical histories, the true prevalence of chronic co-morbidities may be underestimated due to low diagnostic awareness in rural pockets.

## CONCLUSION

Late-life depression represents a highly prevalent, silent public health crisis among elderly women in rural Coimbatore. The strong independent associations with solitary living, absolute financial dependency, physical co-morbidities, and functional limitations underscore that addressing geriatric mental health requires holistic solutions going far beyond standard psychiatric clinical care. There is an urgent, immediate need to integrate routine mental health screenings, utilizing simple tools like the GDS-15, directly into the primary healthcare system at the grassroots level.

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