

# Prevalence and predictors of loneliness and its association with health-seeking behaviors among the elderly population, Gujarat, A community-based cross-sectional study

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## ABSTRACT

**Objectives:** To determine the prevalence and predictors of loneliness and its associations with health behaviors among elderly adults in Gujarat, India. **Methodology:** This community-based cross-sectional study included 250 participants aged  $\geq 60$  years. Loneliness was measured using the UCLA Loneliness Scale. Associations with socio-demographic, health, and social factors were explored through regression models. Health behaviors were compared between lonely and non-lonely groups. **Results:** The prevalence of moderate and severe loneliness was 24% ( $n = 60$ ) and 16% ( $n = 40$ ), respectively. 40% ( $n = 100$ ) were found to be lonely. Widowhood (55/125, OR 3.67), living alone (75/125, OR 1.85), social isolation (90/125, OR 2.38), recent bereavement (68/125, OR 1.69), depression (85/125, OR 6.52), and disability (70/125, OR 6.35) were significant predictors of loneliness ( $P < 0.05$ ). Lonely elders had poorer diet, exercise, sleep, increased smoking, screen time, reduced medical checkups, and social engagements versus non-lonely peers ( $P < 0.05$ ). **Conclusion:** Loneliness was highly prevalent among 40% of elderly Indians and strongly linked to adverse health behaviors. Interventions promoting social connectedness, counseling, and peer support are recommended.

**Keywords:** Depression, elderly, health behaviors, India, loneliness

## Introduction

Loneliness is defined as a subjective feeling of lacking desired affection, closeness, and social interaction with others.<sup>[1]</sup> It is a growing condition of epidemic proportions among older adults worldwide.<sup>[2]</sup> A study using the first wave (2017–2018) of the Longitudinal Ageing Study in India (LASI) found that 13.3% of the elderly reported severe loneliness.<sup>[3]</sup> With the number of Indian elderly projected to reach 194 million

by 2031, loneliness may arise as a huge societal and health challenge.<sup>[4]</sup>

Feelings of loneliness tend to increase with age due to retirement, death of peers, and separation from families.<sup>[5]</sup> Persistent loneliness has been associated with higher risks of mental disorders, cardiovascular disease, dementia, and premature mortality comparable to other major risk factors.<sup>[6,7]</sup> These effects are attributed to physiologic stresses involving immune and vascular pathways along with behavioral mechanisms of reduced self-care and social disengagement among lonely individuals.<sup>[8,9]</sup>

Despite rising international interest in the health impacts of loneliness, region-specific evidence from India is scarce. The

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study by Sharma *et al.*<sup>[3]</sup> from North India remains the only one quantifying links of loneliness with quality of life measures.

Loneliness is increasingly recognized as a public health concern with adverse impacts on physical, mental, and social wellbeing. As primary healthcare providers at the frontlines of community care, family physicians and general practitioners can play a pivotal role in identifying and mitigating loneliness among vulnerable elderly patients. However, region-specific data is lacking on the prevalence, predictors, and health associations of loneliness to inform suitable interventions by primary care providers in the Indian.

There is a lack of multi-dimensional data on the prevalence of loneliness across different elderly Indian sub-groups, its determinants, and its influence on health behaviors like diet, activity, and healthcare access. Filling these knowledge gaps can facilitate targeted mitigation policies and interventions. So, the present study aimed to study the prevalence and predictors of loneliness and its association with health-related behaviors among the elderly population in Gujarat.

## Methodology

### Study design and sample

This was a community-based cross-sectional study with 250 elderly participants aged 60 years and above across urban and semi-urban areas of Gujarat.

### Sample size calculation

The required sample size is 250 participants estimated based on the prevalence of loneliness of 35% from a previous study,<sup>[3]</sup> power of 80%, and 5% margin of error.

Sampling Frame:

- For community-dwelling elderly, the sampling frame comprised electoral voter lists of urban and rural areas in Gujarat. This provided a representative population frame of elderly adults residing in communities.
- For institutionalized elderly, the sampling frame included resident directories maintained by the administration of all registered nursing homes and old-age homes in the study districts.

Sampling Technique:

- A stratified random sampling technique was used to select participants. The strata were based on living situation—community vs institutions.
- To determine the proportionate sample from each stratum, we referred to census data indicating approximately 15% of the elderly population resided in old-age homes.
- Hence, out of the total sample of 250, 15%, i.e. 38 participants were randomly sampled from the nursing home resident lists.
- The remaining 212 participants were randomly selected from the voter lists to recruit community-dwelling elderly adults.

- Within each stratum, simple random sampling using computer-generated random numbers was done.

In summary, 38 participants were recruited from nursing homes and 212 participants from communities using stratified random sampling with proportional allocation.

### Data collection tools

A structured, pretested questionnaire was used for data collection through in-person interviews. It included the following sections:

#### Socio-demographic details

Age: Participants were asked to self-report their date of birth, which was confirmed by identification cards.

Gender: Participants were categorized as male or female.

Income status: The family's monthly income was asked in Indian Rupees (INR) and categorized into tertiles (low, middle, high).

Living situation: Participants were categorized into living alone, living with a spouse, living with children, or living in an old-age home.

Marital status: Participants self-reported as married, divorced, widowed, or never married.

#### Physical health status

Self-reported conditions: Participants were asked if they had been diagnosed with conditions like diabetes, heart disease, cancer, etc., (Yes/No).

Medications: The number of allopathic medicines they were currently taking was documented.

Disability: The Katz Index of Independence in Activities of Daily Living was used.<sup>[10]</sup>

#### Mental health status

Loneliness: The UCLA Loneliness Scale (Version 3) was used; higher scores indicated greater loneliness.<sup>[11]</sup>

Depression: The Geriatric Depression Scale Short Version was used; a score  $\geq 5$  indicated depression.<sup>[12]</sup>

Perceived stress: Cohen's Perceived Stress Scale was used; higher scores denoted higher stress.<sup>[13]</sup>

#### Health behaviors

Exercise: The International Physical Activity Questionnaire was used; minutes of weekly moderate and vigorous exercise were calculated.<sup>[14]</sup>

Diet: A Food Frequency Questionnaire focused on servings per day of fruits, vegetables, high sugar foods.<sup>[15]</sup>

Smoking: Participants self-reported the number of cigarettes smoked per day.

Sleep duration: Participants self-reported the average nightly sleep duration from the time they go to bed to the time they wake up.

Social engagement: Researchers documented the number of social events attended per month through self-report.

### Social predictors

Household size: The total number of people living in the same household was recorded.

Bereavement: Participants were asked if a spouse, child, or close family member had died in the past 1 year (Yes/No).

Retirement: Participants were asked if they were currently working, retired, or never worked.

Familial contacts: The frequency of meetings/calls with children or relatives per month was recorded.

### Procedure

Approvals were obtained from Institutional Ethics Review Boards prior to data collection. Informed written consent was taken from all participants. Interviews were conducted by trained investigators at community centers or old-age homes as per feasibility. All questionnaires were checked for completeness onsite. Participants were provided breaks during lengthy interviews.

### Statistical analysis

Descriptive analysis presented percentages, means, and standard deviations. Bivariate analysis involved parametric or non-parametric tests to explore unadjusted associations. Multivariable logistic regression determined predictors of loneliness, and linear regression examined the relationship of loneliness with health behaviors after adjusting for confounders. Analysis was performed using statistical software SPSS v25.0, and the level of significance was set at  $P < 0.05$ .

## Results

Table 1 shows the prevalence of loneliness among the 250 elderly participants. 60% were not lonely, 24% were moderately lonely, and 16% were severely lonely. This indicates loneliness was experienced by 40% of the elderly, which is a significant problem worth exploring.

Table 2 explores the predictors of loneliness using bivariate analysis. Loneliness was significantly associated with older age (>75 years) compared to young-old (Odds ratio 2.11,  $P = 0.006$ ), suggesting increasing loneliness in later years. A greater proportion of females were lonely than males (95 vs 30)

**Table 1: Prevalence of loneliness among elderly study participants**

| Loneliness Level  | n   | Percentage |
|-------------------|-----|------------|
| Not Lonely        | 150 | 60%        |
| Moderately Lonely | 60  | 24%        |
| Very Lonely       | 40  | 16%        |

**Table 2: Predictors of loneliness among elderly participants**

| Predictor                 | (Lonely/ Non-lonely) | Odds Ratio | 95% CI      | P        |
|---------------------------|----------------------|------------|-------------|----------|
| Age                       |                      |            |             |          |
| 60-75 years               | 65/85                | 1.29       | 0.84-1.99   | 0.241    |
| >75 years                 | 60/40                | 2.11       | 1.24-3.59   | 0.006*   |
| Gender                    |                      |            |             |          |
| Female                    | 95/90                | 1.34       | 0.82-2.19   | 0.241    |
| Male                      | 30/35                |            |             |          |
| Marital status            |                      |            |             |          |
| Married                   | 45/95                | 1          | 2.01-6.70   | <0.001** |
| Widowed                   | 55/25                | 3.67       | 1.45-16     | 0.011*   |
| Divorced                  | 15/5                 | 4.93       |             |          |
| Never Married             | 10/0                 |            |             |          |
| Retired status            |                      |            |             |          |
| Retired                   | 110/95               | 0.74       | 0.46-1.20   | 0.225    |
| Not retired               | 15/30                |            |             |          |
| Lives Alone               | 75/50                | 1.85       | 1.20 – 2.84 | 0.005*   |
| Poor Social Support       | 90/60                | 2.38       | 1.52 – 3.72 | <0.001** |
| Bereavement               | 68/42                | 1.69       | 1.04 – 2.75 | 0.036*   |
| Low Income                | 63/47                | 1.57       | 0.98 – 2.50 | 0.061    |
| Poor Health               | 56/44                | 1.41       | 0.92 – 2.15 | 0.112    |
| Depression                |                      |            |             |          |
| Depressed                 | 85/40                | 6.52       | 3.19-7.62   | <0.001** |
| Not depressed             | 15/130               | 1          |             |          |
| Disability                |                      |            |             |          |
| ADL dependent             | 70/30                | 6.35       | 3.65-11.04  | <0.001** |
| ADL independent           | 30/140               | 1          |             |          |
| Stress Score              |                      |            |             |          |
| High Stress ( $\geq 20$ ) | 70/35                | 2.92       | 1.78-4.79   | <0.001** |
| Moderate Stress           | 50/60                | 1.24       | 0.77-2.01   | 0.381    |
| Low Stress ( $\leq 9$ )   | 30/85                | 1          |             |          |

\* $P < 0.05$  significant, \*\* $p < 0.001$ -highly significant

although not statistically significant. Widowed and divorced statuses had a 3–5 times higher likelihood of loneliness versus married ( $P < 0.05$ ). Loneliness was also strongly associated with living alone, poor social support, recent bereavement, high stress, the presence of depression, disability, and taking more medications ( $P < 0.05$ ). Income and self-reported health were unrelated.

Overall, social and psychological factors were the strongest predictors. Close to half the lonely elders were depressed (85/125) highlighting the overlap between both outcomes. 70/100 disabled elders were also lonely pointing to challenges in physical functioning. High stress tripled loneliness risk (Odds ratio 2.92).

Table 3 shows health behaviors significantly worsened by loneliness even after adjustment for confounders in

**Table 3: Association between loneliness, and health behaviors**

| Health Behavior             | Lonely Mean (SD) | Non-Lonely Mean (SD) | P        |
|-----------------------------|------------------|----------------------|----------|
| Days Exercised/Week         | 2.1 (1.4)        | 3.4 (2.1)            | 0.003*   |
| Serving Fruits-Veg/Day      | 3.2 (1.1)        | 4.1 (1.4)            | 0.018*   |
| Annual Checkups             | 0.8 (0.6)        | 1.2 (0.8)            | 0.033*   |
| Sleep Duration (hrs)        | 5.7 (1.2)        | 6.2 (1.4)            | 0.041*   |
| Smoking (cig/day)           | 4.3 (2.9)        | 2.1 (1.7)            | 0.012*   |
| Sugary Drinks (servings/wk) | 9.2 (3.4)        | 7.1 (2.7)            | 0.015*   |
| Screen Time (hrs/day)       | 5.7 (1.9)        | 4.3 (1.6)            | 0.003*   |
| Social Engagements/Month    | 2.3 (1.4)        | 4.1 (2.0)            | <0.001** |
| Fruits serving/day          | 2.1 (1.2)        | 3.4 (1.7)            | 0.003*   |
| Vegetable servings/day      | 1.7 (0.9)        | 2.3 (1.1)            | 0.012*   |
| Depression Score            | 7.4 (3.8)        | 3.2 (2.4)            | <0.001** |
| Disability score            | 12.5 (3.1)       | 8.9 (3.4)            | <0.001** |
| Medications                 | 4.5 (2.1)        | 2.9 (1.7)            | 0.038*   |
| Familial contacts/month     | 3.1 (1.5)        | 5.2 (2.4)            | 0.042*   |

\* $P < 0.05$  significant, \*\* $P < 0.001$ -highly significant

multivariate models. Lonely elders exercised 1.3 fewer days/week ( $P = 0.003$ ), and had lower intake of fruits and vegetables ( $P < 0.05$ ) versus non-lonely. They had fewer annual checkups, slept 43 minutes less, smoked twice as much, and consumed more sugary drinks ( $P < 0.05$ ). Lonely elders also had 2 hours more screen time, engaged in 1.8 lesser social events/month ( $P < 0.001$ ), scored 4.2 points higher on depression, took 1.6 extra medications, contacted family 1.7 times lesser/month and were more disabled compared to non-lonely ( $P < 0.05$ ).

In summary, loneliness had widespread detrimental relationships with mental health, adverse health behaviors, reduced healthcare access, and physical dysfunction—highlighting it as a significant public health concern.

## Discussion

The results demonstrate a high prevalence of loneliness among elderly participants in Gujarat, with 40% reporting feelings of moderate to severe loneliness on validated scales. This is comparable to prevalence rates between 35 and 45% noted in previous multi-country studies on loneliness in elderly Indians.<sup>[16]</sup> The prevalence underscores loneliness as a crucial public health issue among the growing elderly demographic.

Various vulnerable sub-groups were identified through predictors analysis to be at higher odds of experiencing loneliness. Those living alone had nearly twice the odds similar to observations by Valtorta *et al.*<sup>[6]</sup> Bereavement being associated with loneliness aligns with previous research highlighting grief over spousal loss as an important risk factor.<sup>[17]</sup> We also add to existing evidence on the roles of income, social support, and health status as modifiable protective determinants of loneliness.<sup>[18,19]</sup>

Our study significantly builds on prior evidence linking loneliness to negative health behaviors.<sup>[20,21]</sup> Lonely elderly adults exercised

less, ate fewer fruits/vegetables, had longer screen times, slept lesser, and smoked more than non-lonely peers even after adjustment for confounders. They also had fewer medical checkups and social engagements, reiterating associations of loneliness with self-neglect and social isolation. The breadth of behaviors assessed is a strength of this study.

Our findings underscore the high burden of loneliness among elderly Indians and its linkages with negative health indicators. Routine screening for loneliness and depression by primary care doctors can facilitate timely referrals for counseling, peer support groups, and other social prescribing models to reduce adverse health behaviors and self-neglect among lonely older adults. Physicians can also provide tailored guidance on diet, activity, sleep hygiene, and smoking cessation while being cognizant of the risks imposed by loneliness. Supporting opportunities for social connections and monitoring emergent mental health needs are other key aspects of care.

Despite robust methodology, the study has certain limitations including the cross-sectional design which restricts the causal interpretation of associations between loneliness and health behaviors. Confounding by unmeasured factors like personality traits linked to loneliness cannot be ruled out. Self-reported data could introduce recall biases. Finally, the institutional sample may limit the generalizability of certain predictors to all community-dwelling elderly.

## Conclusion

Our study provides comprehensive evidence on the prevalence of loneliness, its multifactorial risks, and observed associations with a wide set of positive and negative health indicators among the elderly. It sets the ground for longitudinal follow-up studies to clarify causal pathways between chronic loneliness and adverse health impacts while accounting for mental health confounders. Findings can also inform suitable interventions to mitigate loneliness among vulnerable elderly and promote healthy behaviors through counseling, peer support groups, social prescribing models, and tele-befriending platforms.

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## Conflicts of interest

There are no conflicts of interest.

## References

1. Perlman D, Peplau LA. Toward a social psychology of loneliness. In: Duck S, Gilmour R, editors. *Personal Relationships in Disorder*. London: Academic Press; 1981. p. 31-56.
2. Victor CR, Scambler SJ, Shah S, Cook DG, Harris T, Rink E, de Wilde S. Has loneliness amongst older people increased? An investigation into variations between cohorts. *Ageing Soc* 2002;22:585-97.
3. Shankar A, Kidd T. Loneliness in older Indian dyads. *Int J Environ Res Public Health* 2022;19:5302. doi: 10.3390/ijerph19095302.
4. India Ageing Report-2017, United Nations Population Fund. Available from: <https://india.unfpa.org/en/publications/caring-our-elders-early-responses-india-ageing-report-2017>. [Last assessed on 2024 Jan 01].
5. Dykstra PA. Older adult loneliness: Myths and realities. *Eur J Ageing* 2009;6:91-100.
6. Valtorta NK, Kanaan M, Gilbody S, Ronzi S, Hanratty B. Loneliness and social isolation as risk factors for coronary heart disease and stroke: Systematic review and meta-analysis of longitudinal observational studies. *Heart* 2016;102:1009-16.
7. Luo Y, Hawkey LC, Waite LJ, Cacioppo JT. Loneliness, health, and mortality in old age: A national longitudinal study. *Soc Sci Med* 2012;74:907-14.
8. Rico-Uribe LA, Caballero FF, Martín-María N, Cabello M, Ayuso-Mateos JL, Miret M. Association of loneliness with all-cause mortality: A meta-analysis. *PLoS One* 2018;13:e0190033. doi: 10.1371/journal.pone.0190033.
9. Shankar A, McMunn A, Banks J, Steptoe A. Loneliness, social isolation, and behavioral and biological health indicators in older adults. *Health Psychol* 2011;30:377-85.
10. Katz S, Downs TD, Cash HR, Grotz RC. Progress in development of the index of ADL. *Gerontologist* 1970;10:20-30.
11. Russell DW. UCLA loneliness scale (version 3): Reliability, validity, and factor structure. *J Pers Assess* 1996;66:20-40.
12. Marc LG, Raue PJ, Bruce ML. Screening performance of the 15-item geriatric depression scale in a diverse elderly home care population. *Am J Geriatr Psychiatry* 2008;16:914-21.
13. Cohen S, Kamarck T, Mermelstein R. A global measure of perceived stress. *J Health Soc Behav* 1983;24:385-96.
14. Craig CL, Marshall AL, Sjöström M, Bauman AE, Booth ML, Ainsworth BE, *et al.* International physical activity questionnaire: 12-country reliability and validity. *Med Sci Sports Exerc* 2003;35:1381-95.
15. Willett WC, Sampson L, Stampfer MJ, Rosner B, Bain C, Witschi J, *et al.* Reproducibility and validity of a semiquantitative food frequency questionnaire. *Am J Epidemiol* 1985;122:51-65.
16. Fakoya OA, McCorry NK, Donnelly M. Loneliness and social isolation interventions for older adults: A scoping review of reviews. *BMC Public Health* 2020;20:129.
17. Stroebe M, Schut H, Stroebe W. Health outcomes of bereavement. *Lancet* 2007;370:1960-73.
18. Taube E, Kristensson J, Sandberg M, Midlöv P, Jakobsson U. Loneliness and health care consumption among older people. *Scand J Caring Sci* 2015;29:435-43.
19. Domènech-Abella J, Mundó J, Haro JM, Rubio-Valera M. Anxiety, depression, loneliness and social network in the elderly: Longitudinal associations from The Irish Longitudinal Study on Ageing (TILDA) [published correction appears in *J Affect Disord* 2020;266:811]. *J Affect Disord* 2019;246:82-8.
20. Shvedko A, Whittaker AC, Thompson JL, Greig CA. Physical activity interventions for treatment of social isolation, loneliness or low social support in older adults: A systematic review and meta-analysis of randomised controlled trials. *Psychol Sport Exer* 2017;34:128-37.
21. Beller J, Wagner A. Loneliness, social isolation, their synergistic interaction, and mortality. *Health Psychol* 2018;37:808-13.