

# Prevalence and determinants of geriatric depression in North India: A cross-sectional study

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## ABSTRACT

**Context:** “Aging India” has become a phenomenon of public health importance. Old age is beset with physical, mental, and social challenges. Among these, mental health concerns are least prioritized in most of the developing countries with depression being the most common and easy to screen. **Aims:** To assess the burden of geriatric depression and determine its association with sociodemographic factors such as religion, age, gender, education, marital status, and family type. **Settings and Design:** A cross-sectional study was conducted in July-August 2018 in village Kirpind in north India. **Methodology:** 162 subjects aged 60 years or more, both males and females participated in the study. Depression was assessed using the 15-item Geriatric Depression Scale and those with a GDS score  $\geq 5$  were categorized as depressed. **Statistical Analysis Used:** Pearson’s Chi-square test and binary logistic regression were used for analysis. **Results:** Nearly 59.3% of subjects had no depression, 33.9% were suffering from mild to moderate depression whereas 6.8% were severely depressed. The mean age of subjects was 69 ( $\pm 7.4$ ) years. Chi-square test was used to study the association of various factors with depression and only female gender showed a positive statistical association. On using binary logistic regression analysis, being female again emerged to be a significant predictor of depression while no other factor was significantly associated with the outcome. **Conclusions:** There is a need to sensitize primary care workers and physicians to identify and manage geriatric depression early. It also points towards the need for multicentric, longitudinal studies evaluating various aspects of geriatric depression.

**Keywords:** Ageing, depression, geriatric, risk factors, rural

## Introduction

The United Nations defines a country as “Graying Nation” where the proportion of people over 60 years reaches 7% of the total population. In India, at the dawn of the millennium, almost 7.7% (77 million) of the total population were old, amounting to 8.6% (104 million) in 2011 and 9.4% in 2017 (125 million).<sup>[1]</sup> Advances in healthcare technologies coupled with

epidemiological transition are expected to augment this growth and by the year 2050, India’s older adult population is expected to reach 19% (324 million).<sup>[2]</sup> This population aging can be seen as a triumph for public health experts, but it also brings with it challenges of maintaining their optimal health and ability to perform domestic and self-care activities as well as their safety.<sup>[3]</sup>

Age is a vital predictor of mental health. Old age is afflicted with triple jeopardy comprising of not only physical aging but also with the challenges affecting the mental and social well-being.<sup>[2]</sup> Infirmities due to comorbidities, desolation, lack of personal and financial autonomy are other important factors that underscore the higher prevalence of psychiatric illnesses in the elderly.

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Among the various psychiatric illnesses, depression is the most common in the geriatric age-group.

Although India is the second most populated country in the world in terms of the elderly population,<sup>[2]</sup> geriatric depression is yet to be noticed as a potential threat. It is commonly under diagnosed and under treated probably due to the misconception that depression is a normal part of aging rather than a treatable condition. The future projections of global disability-adjusted life year (DALY's) in the year 2020 show that mental disorders are projected to increase to 15% of the global disease burden and unipolar major depression could become the second leading cause of disease burden next to ischemic heart disease.<sup>[4]</sup>

It is, therefore, crucial to quantify the magnitude of depression in old citizens. The Geriatric Depression Scale (GDS) has been used extensively to screen for geriatric depression. The original GDS has 30 questions wherein participants are asked about their feelings over the past week. A short-form GDS was developed in 1986 and includes 15 questions from the long-form GDS which showed the highest correlation with depressive symptoms in validation studies.<sup>[5]</sup> The GDS-15 is easy to use in ill and demented patients with short attention spans or easily fatigability.

Very few community-based studies have been conducted in Jammu to screen and scale the magnitude of this iceberg phenomenon but such research is imperative for planning sustainable public health interventions as depression in itself is a risk factor for various other life-threatening diseases. Therefore, the most effective strategy to tackle this issue is early diagnosis and treatment. Our study is an attempt to generate evidence about the burden and determinants of depression among elderly persons in rural community-based settings where the delivery of primary care services needs to be evaluated and strengthened.

## Objectives

1. To assess the burden of depression among the elderly
2. To determine the association of depression with sociodemographic factors such as religion, age, gender, education, marital status, family type, etc.

## Methodology

A cross-sectional study was conducted in village Kirpind of block R S Pura in north India in July- August 2018. A line listing of all the elderly in the study area was done by the house to house visits. A total of 183 elderly, both males and females, aged 60 years or more were found in the population under study. In the absence of data on the prevalence of depression among the elderly in this area, for calculating sample size, we considered the prevalence of 11.6% as reported in the meta-analysis of six community-based studies.<sup>[6]</sup> Using an absolute precision of 5%, at 95% confidence limits and a design effect of 1, the minimum sample size calculated was 158. After applying inclusion and exclusion criteria, 162 out of 183 elderly were found eligible

to participate in the screening and all of them were included in the sample.

Informal verbal consent was obtained from the study participants after explaining the nature and duration of the study. Assurance was given to the individual that the assessment report will be kept confidential. The data were collected by trained interns, medical social workers, MBBS undergraduates, and postgraduate students under the supervision of faculties. The data collection team had undergone training in the department of community medicine. Depression was assessed using the 15-item GDS, which is a self-reported, basic screening measure of depression in the elderly.<sup>[7]</sup> A valid Hindi language version of GDS-15 was made available and used where ever needed.

For lack of consensus on the age at which a person becomes old, many developed nations have accepted the chronological age of 65 years as a definition of "elderly." Moreover, there is no standard numerical criterion, but the UN agreed cutoff is >60 years to refer to the older population.<sup>[8]</sup> The questionnaire used in the study included information on sociodemographic variables, body mass index (BMI), and the GDS-15. The sociodemographic information included age, gender, religion, literacy, marital status, and family type. Depression was assessed on a score of 15 using a shorter version of Yesavage's GDS- a 15-question instrument. Scores of 0–4 were considered normal, 5–8 indicated mild depression; 9–11 implied moderate depression, and 12–15 pointed towards severe depression. Any score above 5 on the GDS-15 is an indication for an in-depth psychological evaluation, so respondents found positive for depression on screening were referred to the psychiatry outpatient department of the institute. For the respondents who were illiterate or were not keen or unable to fill the questionnaire due to any reason, the questions were read out and responses recorded.

## Inclusion criteria

- Individuals aged 60 years and above
- Permanent residents and elderly residing in the study area for at least 1 year preceding the date of the survey
- Elderly who gave consent to participate in the study.

## Exclusion criteria

- Individuals less than 60 years.
- Elderly people who did not give consent to participate in the study.
- Individuals from locked houses and those who could not be contacted even after two visits.
- Elderly individuals having aphasia, disorders of speech, and hearing.
- Severely demented patients and hospitalized elderly or those residing in old age homes, etc.
- Those with diagnosed psychiatric illness or neurological disorders other than depression.

## Statistical analysis

The data were analyzed using IBM SPSS Statistics for Windows, Version 23.0 (IBM Corp. Armonk, NY, USA) and Vassar stats. All the tests were performed at a significance level of 5%, thus an association was significant if the 'P' value was less than 0.05. Categorical variables were presented as percentages (%) and quantitative data were presented as mean ( $\pm$  standard deviation). Pearson's Chi-square test was used for categorical variables. Binary logistic regression was used to find out the independent association of various factors with depression. The outputs of regression analysis were presented as adjusted Odds Ratio (OR) with 95% Confidence Interval.

## Results

As observed in Table 1, the population of the village comprised mainly of Hindus and Sikhs. There was only one elderly Muslim residing in the village. Depression was observed equally among both the main religions. Depression was seen to occur significantly more in females, among whom two-thirds were depressed. Those elderly who were living with spouses reported lesser rates of depression while more than half of divorced/widowed and separated elderly were suffering from depression. Slightly more percentage of depression was seen among the elderly living in nuclear families but the results were not statistically significant. The almost equal burden of depression was observed in all the age groups while in the case

of obese, it was interesting to note that almost two-thirds of the elderly were not depressed.

Table 2 shows that 40.7% of the subjects reported depressive symptoms. However, out of the 66 depressed senior citizens in the total sample, 65% had only mild depression while moderate to severe depression was observed in 14.2% of the total sample.

Binary logistic regression [Table 3] was done to determine the effects of age, gender, religion, education, marital status, type of family, and obesity on the likelihood that participants have depression. The logistic regression model explained 16.6% (Nagelkerke  $R^2$ ) of the variance in depression and correctly classified 65.4% of cases. Males had 75% fewer odds of suffering from depression than females. Association with no other factor showed statistically significant odds of suffering from depression.

## Discussion

Positive aging is a personal and societal goal for all, which encompasses economic security, well-being, support from family and freedom, and yet it remains elusive to most perennials. In the present study, the prevalence of depression among the rural elderly was found to be 40.7%. Other similar community-based studies reported prevalence rate varying from 8.9% in Ludhiana,<sup>[6]</sup> 14.4% in Haryana,<sup>[9]</sup> 23.55 in Iran,<sup>[10]</sup> 23.67% in Karachi,<sup>[11]</sup> 29.94% in Dehradun,<sup>[12]</sup> 32.6% in a rural area of Karnataka,<sup>[13]</sup> 35.5% in

**Table 1: Characteristics of the study participants (n=162)**

Variables	Depression					
	Absent n (%)	Present n (%)	Total	Percentage of total	Chi-square value	P
Religion						
Hindus	50 (59.5)	34 (40.5)	84	51.9%	0.005	0.943
Sikhs/Muslims	46 (58.9)	32 (41.1)	78	48.1%		
Gender					14.094	0.0002*
Females	31 (43.1)	41 (56.9)	72	44.4%		
Males	65 (72.2)	25 (27.8)	90	55.6%		
Education					2.945	0.086
<8 <sup>th</sup> grade	48 (53.3)	42 (46.7)	90	55.6%		
>8 <sup>th</sup> grade	48 (66.7)	24 (33.3)	72	44.4%		
Marital status					1.086	0.297
Married	89 (60.5)	58 (39.5)	147	90.7%		
Divorced/widowed	7 (46.7)	8 (53.3)	15	9.3%		
Type of family					0.457	0.499
Joint/3 generation	77 (60.6)	50 (39.4)	127	78.4%		
Nuclear	19 (54.3)	16 (45.7)	35	21.6%		
Age group					0.476	0.788
60-69 years	49 (58.3)	35 (41.7)	84	51.9%		
70-79 years	35 (62.5)	21 (37.5)	56	34.6%		
80 or more	12 (54.5)	10 (45.5)	22	13.6%		
Body Mass Index					1.55	0.669
<19	8 (57.1)	6 (42.9)	14	8.6%		
19-<21	5 (62.5)	3 (37.5)	8	4.9%		
21-<23	11 (47.8)	12 (52.2)	23	14.2%		
23 or greater	72 (61.5)	45 (38.5)	117	72.2%		
Total	96 (59.3%)	66 (40.7%)	162 (100.0%)			

\*P-value <0.05 statistically significant

**Table 2: Distribution of study group as per grades of depression (n=162)**

Grades of depression (GDS Score)	Frequency n (%)
No depression (0-4)	96 (59.3)
Mild depression (5-8)	43 (26.5)
Moderate depression (9-11)	12 (7.4)
Severe depression (12-15)	11 (6.8)
Total	162

**Table 3: Binary logistic regression for risk factors of geriatric depression**

Variable	P	Adjusted OR	95% C.I. for AOR	
			Lower	Upper
Religion*				
Hindus	Reference			
Sikhs	.255	.643	.301	1.375
Gender				
Females	Reference			
Males	.0003	.258	.123	.541
Education				
<8 <sup>th</sup> grade	Reference			
>8 <sup>th</sup> grade	.376	.706	.327	1.527
Marital status				
Married	Reference			
Divorced/widowed	.975	1.019	.311	3.337
Type of family				
Joint/3 generation	Reference			
Nuclear	.472	1.359	.590	3.133
Age group				
60-69 years	Reference			
70-79 years	.293	.457	.106	1.967
80 or more	.390	.305	.020	4.574
Body Mass Index				
<19	Reference			
19-<21	.836	.814	.116	5.712
21-<23	.544	1.581	.361	6.936
23 or greater	.960	1.032	.298	3.574

\*As only one Muslim family resided in the village, for LR this subject has been excluded

Tamil Nadu,<sup>[14]</sup> 45.9% in slums of Mumbai,<sup>[15]</sup> 57.6% and 69% in two different studies in Puducherry<sup>[16,17]</sup> etc., The findings of the present study are in tune with an estimated prevalence of 34.4% in India, observed in a systematic review by Pilania *et al.*<sup>[18]</sup> and global aging and adult health Wave-1 study.<sup>[19]</sup> conducted from 2007 to 2010 in six countries which showed that the prevalence of depression was highest in India (27.1%) followed by Mexico (23.7%), Russia (15.6%), Ghana (11%), South Africa (6.4%), and least in China (2.6%). In our study, depression was more among females (56.9%) than among males (27.8%) which corroborates with other studies.<sup>[5,6,9,14-16,20-22]</sup> Depression was higher among illiterates and those with formal education less than 8<sup>th</sup> grade (46.7%) which is similar to the findings of various other studies.<sup>[6,15,16,20,21]</sup> Living without a spouse was also seen as a risk factor in the present study, a finding which has been established earlier by various other researchers.<sup>[5,6,14,16,20,21,23]</sup> This highlights the fact that depression or indeed any mental illness is multifactorial, hence an all-inclusive approach to healthcare

focusing on physical, social and mental well-being is required if we are to confront the problem of depression in the community.

## Limitations

1. The method used in this study is meant only for screening purposes and is not a replacement of diagnosis as done by a clinician
2. The prevalence of depression is based on self-reported data may be subject to recall bias
3. The small sample size affects generalizability
4. No confirmed diagnosis of depression was made in the sample used in the study as the individuals who were referred to the psychiatry OPD were not followed up
5. Being a cross-sectional study, causality cannot be established
6. There could be potential confounders that could affect the results
7. Finally, while the data may be extrapolated to rural India, it may not be relevant to urban India, as sociocultural determinants vary widely in urban and rural areas.

## Conclusions and Recommendations

These high prevalence rates point towards the need to sensitize primary care physicians coupled with the strengthening of primary healthcare settings to screen, diagnose, and manage depression in the elderly. There is a pressing requirement to establish geriatric wards and geriatric OPD's offering subsidized healthcare services with physicians, psychiatrists, and social workers. The government should take the initiative to set up geriatric clubs where the elderly can spend time and share their thoughts. Social support networks for the elderly provide a means to identify new ways of finding meaningful relationships, with people of similar ages, experiences, and even losses. The involvement of NGOs and voluntary organizations are equally important. Besides, health policy needs to address the issue of depression with particular reference to the relevant socioeconomic risk factors for depression such as lack of social security and lack of subsidized healthcare for the senior citizens. There is a need for multicentric, longitudinal studies evaluating various aspects of depression. Interventional studies are also needed to analyze the effect of counseling, health education, and to formulate treatment guidelines for geriatric mental health to improve the quality of life among them.

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## Conflicts of interest

There are no conflicts of interest.

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