

## DEPRESSION IN ELDERLY: A CROSS-SECTIONAL STUDY IN RURAL SOUTH INDIA

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**Abstract :** The objectives of the study were to determine the prevalence of depression in elderly rural population and also study the socio-demographic correlates of the depressive disorders among the elderly in this community. It was cross sectional study performed on the elderly subjects of rural area of Udipi taluk Karnataka in South India over 8 months period. A total of 627 elderly individuals of age group of 60 years and above, were interrogated : results were subjected to statistical analysis i.e proportions and their 95% confidence intervals, Chi-square test, multiple logistic regression and its 95% confidence interval. The prevalence of depression in elderly population was determined to be 21.7%. The prevalence in the age group of 80 years and above and those individuals who had a history of death in the family within the last six months were found to be 34.4% and 52.4%, respectively. Multiple logistic regression analysis revealed that these two correlates were independently associated with depressive disorders in elderly population.

**Key words:** Depression, Prevalence, Correlates, Elderly, Multiple Logistic Regression

### INTRODUCTION

The Indian aged population is currently the second largest in the world. The proportion of those who would be aged 60 years and above is estimated to be 7.7% for the year 2000, and this proportion is expected to reach 12.6% in 2025.<sup>1</sup> A high prevalence of mental disorders is seen in old age. Predominant among these is *depression*<sup>1</sup>. The future projections of global 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 disease burden after ischemic heart disease<sup>2</sup> especially in high-income countries. The community-based mental health studies have revealed that the point prevalence of depressive disorders among the geriatric population in India varies between 13 and 25 percent According to the observations made by the World Health Organization, the *correlates* = *disorders in old age* are reported as genetic susceptibility chronic disease and disability, pain,, frustration with limitations in activities of daily living - events (widowhood, separation, divorce, bereavement, poverty, social, isolation ) and lack of adequate social support. Though depression is the commonest mental health problem in old age, very few community-based studies had been conducted in India, to understand the problem. No such study had been conducted in the past in Udipi taluk of Karnataka. Considering this background, a community-based mental health study was conducted in the rural area of Udipi taluk to determine the disease burden of depressive disorders and to study the correlates of depression among the elderly in the community.

### MATERIAL AND METHODS

The rural field practice area of the Department of Community Medicine, Kasturba Medical College, Manipal is located in the coastal area of Udipi taluk in Udipi District of the state of Karnataka in South India. The total geriatric population ( $\geq 60$  yrs) in the field practice area is approximately 10.5% of the total population covered by the rural field practice area.

**Study period:** 8 months ( March to October 2002).

**Setting:** Three villages i.e.—Udayavara, Kadekar, and Katapady.

**Study Design :** Cross-sectional study.

The sample size was estimated for finite population with the help of EPI-info version 5.0 statistical package. The total geriatric population ( $>=60$  yrs.) covered by the 3 RMCW homes was estimated to be of 2259. Here, the confidence level was taken as 95%, 11.2% prevalence rate of depression, required relative precision of the estimate was set at 20% and

a non-response rate of 10% was included; hence, the final sample size was determined as 627.

**Sample size :** 627 people in the age group of 60 yrs and above, who were permanent members of their respective households, were selected for the study.

**Sampling method :** Simple Random Sampling 'without replacement method using the Probability proportionate to size (PPS) technique was used.

**Sampling Procedure - Exclusion criteria:** If a designated house was found locked during the first visit and the eligible residents could not be contacted and even after 2 successive revisits then they were all excluded from this study. **Criteria For Defining A Non-Respondent:** If a designated respondent was non-cooperative or had severe behavioural problems or cognitive impairment, had severe hearing impairment or articulation disorder, had any terminal illness or if he could not be contacted during two separate revisits after the first, then he was considered a non-respondent

**Selection Procedure:** Due to some on-going projects in some of the field practice areas, only 3 centres out of the total 6 RMCW (Rural Maternity And Child Welfare) Homes were chosen for our project As all the villages in the field practice area are culturally and socio-demographically identical, this selection bias had minimal effect on the results, Using PPS (probability proportionate to size) method, the required number of participants from each village was decided. Then the households and participants were randomly selected from updated family folders in RMCW homes using the random number table. All the eligible candidates of the selected households were interviewed as it was presumed that the effect of genetic susceptibility would be minimal because only 4% of our study population had either 1<sup>st</sup> degree or 2<sup>nd</sup> degree relatives residing together in the same household.

**Study Instruments:** A fact sheet consisting of information regarding the household of the respondent was used for data collection. A semi-structured proforma containing information regarding the socio-economic status of the individual that was later estimated by the modified Udai Pareek Scale<sup>8</sup> was also used, Presence of depressive disorders was determined using the instrument **Mastering Depression In Primary Care Version 2.2:** It had two components: (a) WHO (five) Well-being Index (1998 version), (b) Major (ICD-b) Depression Inventory. Cognitive impairment was estimated by the 6CIT Dementia Test. Mastering Depression In Primary Care Version 2.2 and the 6CIT Dementia Test were translated into Kannada and Hindi by the researchers and back-translated into English by another expert, not acquainted with the original versions. The back-translation was subsequently compared with the original version by a psychiatrist for conceptual equivalence of the items.

#### Organization Of Field Work And Data Collection

The investigator, along with three field ANMs (auxiliary nurse mid-wives),

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were trained by the psychiatrists on how to administer the questionnaires. All our study instruments were pre-tested to determine whether they optimally suited our field conditions. At the beginning, officials of the local panchayat office, village leaders, Anganwadi workers and the ANMs were contacted and their help was sought to understand the geography of the sites and to trace the households. After informed verbal consent was obtained, the designated respondent(s) of a particular household was administered the selected sets of questionnaires by the investigator along with the help of the field ANMs. Care was taken to ensure privacy and confidentiality of the interview as part of the study. A brief general health check-up of the respondent was conducted at the beginning to establish a good rapport with him and also to gain his confidence. All the questionnaires administered in the field were evaluated and rated on the spot, and if a respondent became positive in any of our screening or diagnostic instruments he was immediately handed over a referral slip and sincerely requested to visit the psychiatry OPD of Kasturba Hospital, Manipal at the earliest for a free consultancy. The participants having obvious medical disorders were referred to the nearest RMCW homes for a free health check-up. The diagnoses generated by the instruments in our study were strictly kept confidential and were reconfirmed by consulting a senior faculty member of the department of psychiatry of KMC Hospital, Manipal before arriving at a final ICD-b diagnosis for data analysis.

#### Data Analysis

The collected data was tabulated and analysed by using the statistical package SPSS (Statistical Package For Social Sciences) version 10.0 for Windows. Findings were described in terms of proportions and their 95% confidence intervals. chi-square test was applied to study the relationship between different variables and depression. To determine the independent effect of various factors on depressive disorders, multiple logistic regression was performed and their significance was estimated in terms of adjusted OR and its 95% confidence interval. *P* value less than 0.05 was considered as significant.

## RESULTS AND DISCUSSION

During our field survey, 487 households were visited and 627 individuals in the geriatric age group of 60 years and above were contacted. Among these 627 elderly people, we could interview only 609 individuals for the assessment of depressive disorders (97.1%). The 18 individuals, whom we could not interview due to various reasons, were categorized as *non-respondents* (2.9%). The baseline characteristics of the population surveyed revealed that 36.0% were males while 64.0% were females. Majority (52.6%) belonged to the age group of (60-69) years. Only 58.7% of the elderly were literates. Majority (61.2%) belonged to the middle socio-economic status and 56.3% of the individuals were married.

The overall prevalence of depressive disorders among the elderly of 60 years and above was found to be 21.7% (95% CI 18.4-24.9). Our study findings were consistent with the observations made by Nandi et al<sup>4</sup>, West Bengal, Ramachandran V. et al<sup>5</sup> Madras and Tiwari S.C. Lucknow,<sup>3</sup> who had determined the prevalence of depressive disorders in the geriatric population to be 22.0%, 24.1% and 13.5% respectively. However, a high prevalence of depressive disorders of 52.2% among the elderly 60 years was observed in the study conducted by Nandi et al<sup>9</sup> in the rural areas of West Bengal. In contrast to these observations, Rao Venkoba A. et al<sup>10</sup> Madurai had recorded the prevalence of depression to be as low as 6.0%. Studies conducted by Newman at Canada, and Kennedy et al<sup>6</sup>, USA reported prevalence of depression among the elderly to be 11.2% and 16.9%; respectively. We had also assessed the status of positive well-being by using the WHO (Five) Well-Being index (version 1998). We had observed that the prevalence of depressive disorders was high among individuals whose status of positive well-being was poor (75.9%) as compared to those who were satisfactory (5.3%). Table 1 Shows the prevalence of depressive disorders according to various socio-demographic correlates.

In this study, the prevalence of depressive disorders was higher among

Table 1: Prevalence of Depressive Disorders according to the Socio Demographic Correlates

Socio Demographic Correlates	Number Of Subjects Interviewed (N)	Individuals With Depressive Disorders (N)	Prevalence Of Depressive Disorders (%)	$\chi^2$ , df, p
1. Sex				
Male	216	43	19.9	$\chi^2 = 0.6$ , $df=1$ , $p = 0.433$
Female	393	89	22.6	
2. Age Group (Years)				
60-69	320	56	17.5	$\chi^2$ for linear trend = 36.0, $p < 0.001^*$
70-79	228	55	24.1	
80	61	21	34.4	
3. Religion				
Hindu	488	110	22.5	$\chi^2 = 1.2$ , $df=2$ , $p = 0.548$
Christian	81	14	17.3	
Muslim	40	8	20.0	
4. Socio-Economic Status				
Low	210	53	25.2	$\chi^2 = 2.9$ , $df=2$ , $p = 0.232$
Middle	377	76	20.2	
High	22	3	13.6	
5. Marital Status				
Married	342	70	20.5	$\chi^2 = 0.7$ , $df=1$ , $p = 0.413$
Unmarried/ Widowed/ Separated	267	62	23.2	
6. Type Of Family				
Nuclear	165	34	20.6	$\chi^2 = 0.2$ , $df=1$ , $p = 0.674$
Joint / Extended	428	95	22.2	
7. Living Arrangement In The Household				
Living With Spouse	318	66	20.8	$\chi^2 = 0.5$ , $df=2$ , $p = 0.784$
Living Only With Children/Relatives	275	63	22.9	
Living Alone	16	3	18.8	
8. Literacy Status				
Illiterate	252	64	25.4	$\chi^2 = 3.5$ , $df=1$ , $p = 0.061$
Literate	357	68	19.0	
9. Previous Occupation				
Unskilled	212	49	23.1	$\chi^2 = 4.3$ , $df=3$ , $p = 0.230$
Skilled	159	39	24.5	
Professional	39	4	10.3	
Housewife	199	40	20.1	
10. Habits				
Smoking	92	19	20.7	$\chi^2 = 0.1$ , $df=1$ , $p = 0.798$
Alcohol Consumption	103	30	29.1	
Tobacco Chewing	241	63	26.1	
Pan Chewing	303	78	25.7	
11. Family History Of Psychiatric Illness				
Present	41	8	19.5	$\chi^2 = 0.1$ , $df=1$ , $p = 0.728$
Absent	568	124	21.8	
12. History Of Death In The Family Within Last 6 Months				
Present	21	11	52.4	$\chi^2 = 12.1$ , $df=1$ , $p = 0.001^*$
Absent	588	121	20.6	

\* *p* value < 0.05 is considered as significant

females (22.6%) than males (19.9%), but this difference was not found to be statistically significant ( $\chi^2 = 0.616$ ,  $df=1$ ,  $p = 0.433$ ). Our study findings are consistent with the study by Blazer<sup>12</sup> (1979, North Carolina), where the prevalence of depression was similar in both sexes. However, the studies conducted by previous workers<sup>5,6,11,13</sup> had documented a high prevalence of depression among the elderly females. Higher standards of living, matriarchal family system and a high female literacy rate (94.6%) could explain a lower prevalence of depression among females in our study.

The age of the respondents ranged between 60 to 93 years, while the mean age was found to be 69.0 years (SD 6.8). The prevalence of depressive disorders was highest (34.4%) in the age group of 80 years and above. The difference in prevalence of depression between different age groups was found to be statistically significant ( $\chi^2 = 9.932$ ,  $df=2$ ,  $p = 0.007$ ). The prevalence of depressive disorders showed a positive linear trend of increase with the progression of age, which was also found to be statistically significant. Majority of the population were Hindus (80.1%). The prevalence of depressive disorders did not vary widely among the Hindus (22.5%), Christians (17.3%) and Muslims (20.0%) and the difference was not found to be statistically significant. Similar findings were reported from a study conducted by Tiwari<sup>3</sup>. The prevalence of depressive disorders was high among the individuals belonging to the low economic status (SES) group (25.2%) and high socio-economic status (13.6%) groups. But the difference between these groups was not found to be statistically significant. Studies conducted by several workers<sup>5,6,13</sup> had observed the prevalence of depressive disorders to be significantly higher among the elderly belonging to the low SES group. The prevalence of depressive disorders was similar among the unmarried widowed or separated individuals (23.2%) as compared to their married counterparts (20.5%). Our study findings were not consistent with the previous studies<sup>56</sup> who had documented a significantly high prevalence of depressive disorders among the widowed individuals, in this study, we had observed that majority of the unmarried, widowed or separated individuals were women (92.1%) with only a few staying alone (5.6%) and deprived of any living child (5.2%). Better

standards of living, a satisfactory level of family support systems network, high female literacy rate (94.6%) and matriarchal family system could explain a lower prevalence of depression among these individuals in our study.

In this study we found that the prevalence of depressive disorders remained similar in case of both nuclear (20.6%) and print/extended families (22.2%). The respondents, staying alone 16 (2.6%), were not included under nuclear family. - In this study, only 16 (2.6%) of the individuals were living alone. The prevalence of depression among those who were staying alone, living only with their children or relatives or living with their spouse was found to be 18.8%, 22.9% and 20.8% respectively. But the difference between these groups was not found to be statistically significant. These findings were in contrast with the studies conducted by Ramachandran<sup>5</sup>.

Blazer Dan<sup>12</sup> and Kennedy Gary J.<sup>6</sup> who had observed a significantly high prevalence of depression among those living alone.

The prevalence of depressive disorders among illiterates was higher (25.4%) as compared to literates (19.0%). The difference between the two groups was however, not found to be statistically significant. Ramachandran V.<sup>15</sup> Madrasad also reported similar observations. Studies conducted by Kennedy et al<sup>16</sup> and Penninx et al also reported a significantly higher prevalence of depression among individuals with lower level of education. None of the respondents were unemployed in the past. The proportion of housewives affected with depressive disorders was 20.1%. The prevalence of depressive disorders was almost similar among the unskilled (23.1%) and skilled (24.5) labourers. Some of the previous<sup>5,6</sup> had reported a higher prevalence of depression among the unemployed individuals.

As compared to smoking and alcohol consumption (17.2%), tobacco chewing (39.2%) and pan chewing (49.9%) habits were common among the geriatric population in Udupi Taluk. In this study, the prevalence of depression was found to be significantly high among the having pan chewing individuals (25.7%), tobacco chewing (26.1%) and alcohol consumption (29.1%) habits. In a study conducted by Hämäläinen J. et al<sup>14</sup> from Finland, it was found that cigarette smoking and alcohol consumption were important risk factors for major depressive episode.

The prevalence of depression was similar among those who gave a history of psychiatric illness (19.5%) as compared to those without family history of psychiatric illness (21.8%) and the difference between the groups was not found to be statistically significant. These findings are in contrast with the observations by Ojen Van<sup>15</sup> who reported a significantly high prevalence of depression among those with a positive family history of mental disorders. This difference from our study might be due to social stigma resulting in considerable number of under-reported and undiagnosed cases of mental illness.

The prevalence of depression was high among the individuals who had a history of death in their family within the last 6 months. The difference between the two groups was found to be statistically significant. Similar observations were also noted by Kennedy Gary<sup>6</sup>.

Table 2 describes the association between correlates of depressive disorders according to the univariate as well as the multivariate analysis.

It was observed by univariate analysis age group of 80 years and above and a history of death in the family within last 6 months had strong and significant association with depressive disorders. However, Multiple Logistic Regression analysis revealed that age group of eighty years and above and a history of death in the family within last six months had independent significant association with depressive disorders in the geriatric population. These findings are consistent with the observations from the study conducted by Kennedy Gary<sup>6</sup>.

### CONCLUSIONS

In this study, the prevalence of depressive disorders among the geriatric population was determined to be 21.7%. The prevalence rates of depression among the males and females were 19.9% and 22.6%, respectively. Multiple logistic regression analysis revealed that age group of 80 years and above and a history of death in the family within the last six months were independently associated with depressive disorders in the geriatric population.

### LIMITATIONS

Due to feasibility constraints, we could not interview the people who lived in the open and were homeless. Due to the lack of practical skills in communication, we could not interview the non-respondents who were having severe hearing impairment and aphasia. Since the proportion of non-respondents and the individuals who were homeless was very small in our study population, we expect only a minimal effect on our prevalence estimate.

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Table 2: Correlates Of Depressive Disorders:

Correlates Of Depressive Disorders	Category	OR (Unadjusted)	95% C.I.	OR (Adjusted)	95% C.I.	p value
Gender	Male	1.00	-	-	-	-
	Female	1.18	0.78-1.77	1.27	0.71-2.26	0.419
Age Group (yrs)	(60-69) yrs	1.00	-	-	-	-
	(70-79) yrs	1.50	0.99-2.28	1.36	0.84-2.18	0.211
	≥80yrs	2.48	1.36-4.52	2.03	1.02-4.05	0.045*
Socio-economic Status	High	1.00	-	-	-	-
	Middle	1.60	0.46-5.55	1.52	0.41-5.71	0.536
	Low	2.14	0.61-7.51	2.58	0.66-10.00	0.171
Marital Status	Married	1.00	-	-	-	-
	Unmarried/ Widowed/ Separated	1.18	0.80-1.73	0.98	0.30-3.22	0.976
Living arrangement in the household	Living with spouse	1.00	-	-	-	-
	Living only with Children/ Relatives	1.14	0.77-1.68	0.64	0.19-2.12	0.462
	Living Alone	0.88	0.24-3.18	0.58	0.10-3.42	0.548
Literacy Status	Literate	1.00	-	-	-	-
	Illiterate	1.45	0.98-2.13	1.07	0.67-1.71	0.784
Habits	Absent	1.00	-	-	-	-
	Present	1.30	0.82-2.06	1.004	0.59-1.70	0.988
History of death in family in last 6 months	Absent	1.00	-	-	-	-
	Present	4.25	1.76-10.23	5.17	2.03-13.18	<0.001*

\* p value <0.05 is considered as significant