Original Article

Depression and Suicide Attempt during Dementia, and their Clinical Correlation in Elderly Indian Population from LASI Wave I (2017-2018)

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Received: 9 January, 2023
Accepted: 12 April, 2023

DOI 10.51846/jucmd.v2i2.2256

Abstract

Objective: Adult people are more prone to developing physical organ-related or mental disorders due to deterioration of body functions. Dementia is one such condition that prevails among older patients. This survey collates the effects of various demographic characteristics on depression and suicidal tendencies among the adult population with dementia across India. **Methodology:** This was a cross-sectional online survey that included 402 elderly patients (45 years and above) with dementia from different states of India conducted between June 2017 to June 2018. Depression and suicidal tendencies were dichotomized as No-"0" and Yes-"1'. Other explored variables in respect to depression and suicidal tendencies among patients with dementia were age, gender, area of living, wealth index, education, caste, religion, marital status, living arrangement, social security. **Results:** Age, gender and place of living had a significant effect on developing depression among adults with dementia (P<0.05). Factors such as education, wealth index, caste, religion, marital status, living alone or not and the presence or absence of social security didn't have a significant effect on depression amongst people with dementia (p>0.05). In case of emerging suicidal tendencies among patients with dementia all the mentioned categories didn't show significant changes. **Conclusion:** The patients with dementia had a greater inclination towards developing suicidal tendencies. Suicidal tendencies didn't change significantly with age, gender, education, wealth, caste, social security, place of living, living arrangements, and marital status. Depression showed significant effect in terms of gender i.e. female and rural areas. Other socioeconomic characteristics didn't establish significant effect on developing depressive symptoms and dementia.

Keywords: Dementia, Depression, Longitudina Ageing Study in India, Suicidal tendencies, Socioeconomic characteristics.

Introduction

Globally, more than 600 million people are estimated to fall in the age category of 60 years and older. This number is predicted to get doubled by 2025 to 2 billion as per World Health Organization.[1] As age progresses health condition of elderly people deteriorates both physically and mentally. They are more prone to body injuries, metabolic, cardiovascular disorders and other physical illnesses. Neurological disorders impair the Judgment abilities, language deficits and cognitive capacity. These factors add to already slowing down or impaired mental conditions that lead to damaged mental health.[2] It has been found that suicidal tendencies/suicide is one acute problem found in above the age of 60 adults. As of the result these disorders such as anxiety, insomnia, Alzheimer's, depression and vascular dementia are commonly seen.[3] The most common mental disorders found in these population is dementia, mood and anxiety disorders and amongst these cognitive impairment is the most common symptom. A positive correlation exists between the rise in patients with the most common mental disorders such as bipolar disorder, anxiety, and dementia. In addition to depression causes an in increase in the prevalence of suicide in the older adults.[3]

As of the definition, it is known that the syndrome of dementia is mainly categorized as changes in behavior followed by gradual progression of cognitive capacity. These changes are accelerated than normal biological ageing. It is a collative term generally used for various diseases presenting with dementia, such as levy body dementia, Alzheimer's disease, frontotemporal dementia, vascular dementia are categorized by behavioral changes followed by gradual decline of cognitive abilities or vice versa.[4,5] Evidence reported that approximately 50% of all dementia cases are developed as a consequence of Alzheimer's disease.[6,7] The common symptoms observed in patients with dementia depicts progressive behavioral changes, thinking and cognitive abilities worsen over time.[8]

India is currently undergoing swift demographic aging. Careful medical history is an essential component to deal with mental health issues. Having comorbidities in itself builds up a challenging health concern for old age group and when the health system is already overburdened with increasing population, mental health is easily neglected. Underlying past history plays essential role in identifying prevalence of suicide risk factors in elderly population. Thus num-

ber of people with dementia and other later life mental health problems is estimated to rise manifold in upcoming years.[9] The prevalence of depression is poorly understood with dementia among the elderly population. Most of the literature studied are confined to a limited and only certain geographical area. Elderly and older adults having dementia and depression have more than one risk factor for developing suicidal tendencies. It can be beneficial in designing and developing future treatments and prevention measures. Different risk factors have variable effect on depression and suicidal tendencies in adults with dementia. Demographic factors that are explored to check its relation to depression and suicidal tendencies in adults with dementia are gender, education, money, caste, religion, marital status, living arrangements, and social security. It is the need to recognize these risk factors and understand their relationship, particularly in the Indian context where literacy level is still at an alarming level. Hence thorough research and dissemination of research is required for further development of measures to prevent further progression of dementia among adults. Current study is carried out with the objective to find the prevalence of depression and suicide attempts during dementia and their clinical correlation among elderly of India. Furthermore, it is also an attempt to understand the adjusted effect of related co-factors contributing to developing such tendencies.

Methodology

This was a cross-sectional online survey that included 402 patients with dementia from different states of India, conducted during the time period of June 2017 to June 2018.

Sources of Data

The Longitudinal Ageing Study in India (LASI) Wave 1 (2017–18) (IIPS, 2020)10 provided the data for this study. LASI is a comprehensive national scientific inquiry into the causes, effects, and factors of aging populations in India. A total of 402 subjects was a representative sample of more than 72,000 persons 45 years and older. This total 402 subjects were calculated statistically with help of STATA software. To determine the final observed units, the survey used a multi-stage sampling technique mixed with probability cluster sampling design. Three-stage and four-stage sampling designs were used for rural and urban regions. The selection of Primary Sample Units (PSUs) -from sub districts (Tehsils/Talukas) was the foremost step in selected states. Later steps were taken for the chosen PSUs which had the selected villages from rural areas and wards of urban areas. Third step included the selection of households from the particular villages in rural areas. There was an additional step included in the sampling in urban areas after third step, which was the selection of one Census Enumeration Block (CEB). Random selection was done in urban area which was followed by the fourth step where households were nominated from the chosen CEB. The survey report includes a full explanation of the methodology along with information on the research structure and data collection. The 45-year-old and beyond eligible participants were the main focus of the current investigation. 405 elderly people made up the entire sample size for this study. In-depth information from the first national wave of the LASI on aging, their supportive social relationships, familial structures, and subjective wellbeing would be useful in figuring out the adults' particular needs, conditions, and problems in the context of changing societal circumstances.

Outcome Measures

The study's two outcome variables "Depression" and "Suicide" were dichotomized for the analyses. Depression was dichotomized as No-"0" and Yes-"1". The question for identifying depressed individuals "during the last 12 months, was there ever a time when you felt sad, blue, or depressed for two weeks or more in a row. Suicide was also dichotomized as No-"1" and Yes-"0". The question for identifying suicidal tendencies or thoughts was "did you think a lot about death either your own, someone else's or death in general during those two weeks".

Two weeks were referred to as the time when the respondent was feeling uninterested, sad, depressed, of no use, of no good, tired, drained out of energy, trouble concentrating than usual times for at least two weeks in last one year.

Explanatory Variables

The explanatory variables for the study were;

Age of the individual was coded across three groups 45-54 years 55-69 years and 70 plus older adults. Gender was coded as male and female. Place of residence was coded as rural and urban. Education was recoded as no education, up to primary, up to secondary and senior secondary and above. Wealth index was coded as poor, middle and rich. Caste was coded as ST-scheduled caste, SC-scheduled tribe, OBC-other backward castes and others. Religion was recoded as Hindu, Muslim and Others. Marital status was recoded as currently married and not currently married. Living arrangements was recoded as Alone and others social security was recoded as 'yes' for having any sort of social security available to the adults and 'no' for none available.

Statistical Analyses

Descriptive statistics along with cross-tabulation were presented in the current study. Significance and association were checked using Chi-square test. Additionally, binary logistic regression analyses were done to establish association between the outcome variables and explanatory variables.[11] Binary logistic regression model is usually put into a compact form as follows;

$$\text{Logit}[P(Y=1)]=\beta 0+\beta^{*}X\text{Logit}[P(Y=1)] =\beta 0+\beta^{*}X$$

Parameters β0, β estimate log odds of suicidal tendencies for the reference group, where β estimates maximum likelihood, the differential log odds of suicidal tendencies associated with a set of predictors X, as compared to the reference group. The entire analysis was carried out on the individuals who were suffering from dementia. Software used for the whole statistical analyses was STATA version 16.

Results

Out of 402 adults with dementia who took part in this study, reported prevalence of depression was significantly higher in patients (53.3%) in the age group 55-69 as compared to age group 45-54 (50.8%) and 70 plus (39.8%) population (Table 1), while suicidal tendencies were highest in the patients above the age of 70 (76.9%) as compared to other two age groups (55.2% and 54.7%) (Table 2). Logistic regression analysis estimated 27.1% more odds (OR: 1.27 (CI 0.239, 6.75)) for suicidal tendencies for 70 plus age group as compared to 45-54 years age group (p>0.05) (Table 3). Male patients (64.6%) with dementia had shown greater suicidal thinking while female counterparts (57.6%) experienced to be most prone to depression. Women were more likely to exhibit suicidal tendencies than men, when they had dementia [OR: 1.095 CI: 0.288, 4.166].

People residing in rural areas (48.3%) were more depressed patients as compared to urban elderly (42.4%). Depression along with suicidal tendencies were higher in rural part (48.3% vs 42.4% and 62.5% vs 40.4% respectively). Depression amongst adults suffering from dementia was found to be significantly greater in rural geographical areas (p=0.031). The odds ratio for having suicidal tendencies was lower among urban population (OR:0.579 (CI: 0.166, 2.015), p>0.05). Also, patients with dementia whose educational qualification was above senior-secondary level (86.2%) and up-to-secondary level (64.8%) were found to be more prone to have suicidal thoughts (p=0.198) and depression. However, there was no significant change in prevalence of suicidal tendencies and depression among adults with respect to various educational categories (p=0.303 and 0.958 respectively) as shown in Table 1. Education wise, up to secondary level, followed by up to primary level, and senior secondary education level have odds ratio of developing suicidal tendencies of 2.516, 2.113 and 1.046 respectively. Wealth index wise, rich elderly with dementia had highest prevalence of depression (56.7%). While, middle class depressed elderly reported maximum prevalence of suicidal tendencies (75.8%) as shown in Table 3.

Both middle and rich elderly had higher odds ratio of developing suicidal thoughts than poor elderly (OR: 2.147 and 2.29 respectively). No sub-group amongst ST, SC, OBC and others established any statistical significance with regard to depression and suicidal tendencies. Individuals with dementia from castes other than ST, SC and OBC reported to be having higher suicidal tendencies (66.6%). When depression and suicidal tendencies were studied on the basis of religion, muslim people had higher odds of developing suicidal tendencies [OR: 3.088, CI: 0.424,22.50]. The depression and suicide didn't have significant relation with patients' religion.

Loneliness tends to provoke suicidal tendencies. Unmarried patients with dementia were prone to developing suicidal thoughts while married adults with dementia were highly inclined to having depression. Currently married people have lesser chances of developing suicidal thoughts [OR: 0.304 CI: 0.0559,1.656]. Patients with dementia and living arrangements other than alone had higher likeliness of developing suicidal tendencies [OR:4.43 CI: 0.245,80.15]. However vice versa was seen in case of depression. Elderly with dementia have higher prevalence of developing depressive symptoms when living alone. Similarly, patients with dementia who had social security were suffering from depression more than those without social security. On the contrary, patients with dementia who had social security were prone to suicidal tendencies more than who were without social security [OR: 0.747 CI: 0.168, 3.321]. Suicidal tendencies were highest among patients with dementia [OR: 1.14 (CI: 0.350, 3.711)] (Table 3).

Table 1. Mean values of Prevalence of depression amongst adults suffering from dementia in India, LASI (2017-18).

Basic Information	**Depression (Feeling sad, blue, or depressed for two weeks or more in a row) n=402**	
Background characteristics	Prevalence* (95% CI)	Chi square P value
Age group		
45-54 years	50.8 (40.6-61)	6.7128 p = 0.035
55-69 years	53.3 (44.62-61.9)	
70 plus	39.8 (29.83-49.7)	
Gender		
Female	57.1 (48.63-65.57)	0.0000 p = 0.998
Male	41.6 (34.8-48.37)	
Place of Residence		
Rural	48.3 (41.57-54.95)	4.6675 p= 0.031
Urban	42.4 (33.57-51.32)	
Education		
No education	53.9 (37.77-70.13)	3.6433 p = 0.303
Up-to Primary	43.9 (29.71-58)	
Up-to Secondary	64.8 (52.04-77.48)	
Senior-secondary and above	55.8 (33.84-77.7)	
Wealth Index		
Poor	44.4 (35.29-53.44)	2.7150 p = 0.257
Middle	34 (22.14-45.81)	
Rich	56.7 (48.9-64.46)	
Caste		
SC	42.2 (30.04-54.32)	1.2284 p= 0.746
ST	52.8 (35.45-70.17)	
OBC	49.6 (41.39-57.78)	
Others	52.8 (41.84-63.67)	
Religion		
Hindu	46 (39.87-52.1)	1.1495 p = 0.563
Muslim	54 (37.63-70.31)	
Others	47.6 (32.45-62.77)	
Marital Status		

Currently Married	50 (43.41-56.67)	0.022 p = 0.88
Not Currently Married	42.4 (33.33-51.38)	
Living Arrangements		
Alone	26.8 (2.63-50.96)	0.053 p = 0.81
Others	48.2 (42.7-53.64)	
Social Security		
Yes	50.8 (43.85-57.71)	0.0785 p = 0.77

*All the prevalence values are reported in percentage. ST-scheduled caste, SC-scheduled tribe, OBC-other backward castes.

Table 2. Mean values of prevalence of suicidal tendencies among adults suffering from dementia in India, LASI (2017-18).

Basic Information	**Suicidal tendencies (Thinking a lot about death at least for two weeks in last one year)**	
Background characteristics	Prevalence* (95% CI)	Chi square
Age group		
45-54 years	55.2 (34.04-76.34)	0.4251 p = 0.809
55-69 years	54.7 (36.6-72.86)	
70 plus	76.9 (55.2-98.61)	
Gender		
Female	53.6 (36.28-70.89)	0.0883 p = 0.766
Male	64.6 (49.08-80.02)	
Place of Residence		
Rural	62.5 (49.52-75.55)	1.6591 p = 0.198
Urban	40.4 (15.95-64.87)	
Education		
No education	55.4 (21.72-89)	0.3086 p = 0.958
Up-to Primary	67.8 (31.9-103.62)	
Up-to Secondary	49.2 (22.07-76.32)	
Senior-secondary and above	86.2 (36.79-135.69)	
Wealth Index		
Poor	51.1 (30.76-71.44)	1.7894 p = 0.409
Middle	75.8 (47.36-104.27)	
Rich	61.6 (45.61-77.5)	
Caste		
SC	51.9 (21.88-81.99)	2.5527 p = 0.466
ST	17.8 (-26.26-61.76)	
OBC	48.4 (28.42-68.3)	
Others	66.6 (48.48-84.7)	
Religion		
Hindu	63 (49.41-76.63)	3.2528 p = 0.197
Muslim	52 (21.97-82.03)	
Others	44.1 (11.11-77.1)	
Marital Status		
Currently Married	51.2 (36.13-66.17)	0.6426 p = 0.423
Not Currently Married	72.3 (55.09-89.44)	
Living Arrangements		
Alone	87 (53.58-120.52)	0.0587 p= 0.809
Others	57.6 (45.58-69.65)	
Social Security		
Yes	62.8 (48.18-77.4)	0.1019 p = 0.750
No	33 (1.59-64.45)	

*All the prevalence values are reported in percentage.

Table 3. Results of logistic regression of suicidal tendencies on various independent background characteristics (LASI 2017-18).

Background characteristics	**Odds Ratio (mean)**	**CI (mean)**
Age group		
45-54 years	Missing Data	Missing Data
55-69 years	0.634	[0.205,1.965]
70 plus	1.271	[0.239,6.753]
Gender		
Male	Missing Data	Missing Data
Female	1.095	[0.288,4.166]
Place of Residence		
Rural	Missing Data	Missing Data
Urban	0.579	[0.166,2.015]
Religion		
Hindu		
Muslim	3.088	[0.424,22.50]
Others	0.821	[0.164,4.120]
Caste		
SC	Missing Data	Missing Data
ST	2.743	[0.198,37.91]
OBC	1.549	[0.249,9.627]
Others	2.652	[0.398,17.67]
Wealth Index		
Poor	Missing Data	Missing Data
Middle	2.147	[0.511,9.021]
Rich	2.290	[0.688,7.626]
Education		
No education	Missing Data	Missing Data

Up-to Primary	2.113	[0.513,8.696]
Up-to Secondary	2.516	[0.658,9.625]
Senior-secondary and above	1.046	[0.169,6.490]
Marital Status		
Not Currently Married	Missing Data	Missing Data
Currently Married	0.304	[0.0559,1.656]
Living Arrangements		
Alone	Missing Data	Missing Data
Others	4.433	[0.245,80.15]
Social Security		
Not Currently Married	Missing Data	Missing Data
Yes	0.747	[0.168,3.321]
Dementia		
No	Missing Data	Missing Data
Yes	1.14	[0.350,3.711]

Exponentiated coefficients; 95% confidence interval in brackets,
* p<0.05, ** p<0.01, *** p<0.001.

Discussion

The present study attempted at exploring clinical correlation of depression and suicidal attempt among elderly suffering from dementia. It is observed that elderly with dementia is more prone to developing depression.[12,13,14,15,16,17] This study reinforces this evidence as similar pattern of findings were estimated. There have been scarce data on depression and dementia especially in lower economy and developing countries.[18,19,20] Ferri et al. found 43.8% of the persons with dementia in lower economy had depressive symptoms[18]. Gunak et al. in their study also discussed that the risk of suicide attempts was much higher in patients who were recently diagnosed with dementia[21] and the current study corroborates these findings. In a cross-sectional study carried out by Andresen and others on a population of 1612 persons with dementia, they reported depression prevalence of 12.4%. Further they found 18.9% for men and 10.1% for women were suffering from dementia[22]. In current study, 57.1% and 41.6% men and women with dementia respectively had chances of developing depression. Suicidal tendencies were highest in the patients above the age of 70. Male patients had shown greater suicidal tendencies. The prevalence of suicidal tendencies was higher in the rural populations than the urban Table 3. Also, patients whose educational qualification was above secondary were found to be more prone to have these kinds of thoughts. Middle-class people with dementia and unmarried patients were prone to developing suicidal tendencies Table 3. It is vividly established that dementia tends to provoke suicidal tendencies.

A systemic review carried out by Lawrence et al. reported that though religion is supposed to play a protective part against suicide, the empirical evidence is contradictory. Some studies claimed the effect of religion is positive while few considered it as risk factor and some studies made a neutral stance.[23] Very few studies claimed a positive relation of religion, whereas in current study no such significant association in developing suicidal tendencies and depression was observed among patients with dementia. Studies reported that 5% of people asking for help in tertiary care or general hospital were found to be older than 60 years.[8] In this study, patients with dementia aged 55-65 were found to have a higher incidence of depression, and those aged 70 and older had higher prevalence of suicidal tendencies. It was observed in the United States that loneliness and social isolation in older adults are critical health issues leading to increasing the risk of dementia.[24] A study reported that marital status and living situation reported increased risk of suicides in people without a partner or who lived alone, but the same is not found in patients with a partner or who are living with others.[25] However, in this study, social support such as living circumstances (alone or with someone) and marital status, did not have significant effect on people with dementia on developing depression (p=0.881 and 0.818 respectively) as shown in Table 2,3.

Cadar et al. reported that dementia incidence and level of education didn't have a significant association while wealth was strongly related. The hazard ratio measured for developing dementia was observed higher in the lowest 2 quintiles of wealth (Quintile 4: HR, 1.39; 95% CI, 1.00-1.95 and Quintile 5: HR, 1.50; 95% CI, 1.05-2.13; P for trend =0.04) when compared to the highest quintile (Q1), independent to additional covariates such as level of socioeconomic factors and educational factors.[26] In current study, the education level and wealth status both didn't have a significant association with depression and suicidal tendencies among elderly with dementia (p: 0.95, 0.40 and 0.303, 0.25 respectively) while the odds ratio was higher in middle and rich wealth index elderly with dementia. As per the American physiological association, the management of depression for all the adult age group patients should be a combination of psychotherapy and pharmacotherapy.[27]

Conclusion

The patients with dementia were found to be more prone to developing suicidal tendencies. Suicidal tendencies didn't change significantly with age, gender, education, wealth, caste, social security, place of living, living arrangements, and marital status. Depression is found to be higher among females and in rural areas of the states selected. Other socioeconomic characteristics didn't have significant association with developing depressive symptoms and suicidal tendencies.

Recommendations

The mental health treatment of elderly should be an amalgam of both the interventions psychotherapy and pharmacotherapy; hence, such an approach would also help in ad-

dressing this major issue needed to help the elderly. Small awareness groups on risk of suicide in old age population should be conducted along with initiatives for preventing old age abuse should be taken by community health workers. More studies with larger population should be carried out to understand the demographic dynamics of dementia, depression, and suicidal tendencies.

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