Original Article

Prevalence and Predictors of Depression in Community-Dwelling Elderly in Rural Haryana, India

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ABSTRACT

Background: Depression in the elderly has been emerged as a serious public health challenge in the developing countries. Elderly population with depression is on rise in India, but is not adequately addressed. This study was planned to ascertain the prevalence of depression among elderly in a rural population of Haryana and assess its socio-demographic correlates. **Methods:** This study was a community based, cross sectional study, which was conducted in Community Health Centre (CHC), Chiri of Rohtak district (Haryana, India). Of total 124 Anganwadi centres in study area, 10 were randomly selected. A total 500 elderly persons aged 60 years and above were randomly screened for depression. Long form of Geriatric Depression Scale (GDS- 30) was used with cut off score at 22. The Pearson's Chi-squared test, student's t test, and multiple logistic regression were used to assess the association of depression in the elderly with its risk factors. **Result:** In our study, the prevalence of depression in the elderly was 14.4% (95% CI: 11.6- 17.8). Mean age of study population was 68.5 ± 7.7 years. Depression in the elderly had significant association with female gender [OR=2.7 (95% CI 1.4- 5.0)], not being consulted for major decisions [OR=2.7 (95% CI 1.5- 4.7)], presence of any chronic morbidity [OR=2.4 (95% CI 1.3- 4.5)], spending day without doing any activity, work or hobby [OR=3.8 (2.1- 7.1)], and death of any close relative in the last 1 year [OR=2 (1.1- 3.7)] after adjustment of various factors. **Conclusion:** Our study revealed that the prevalence of depression in the elderly was 14.4% in a rural community of north India.

Keywords: Depression, elderly, prevalence, rural

Introduction

Depression affects approximately 350 million people worldwide; constituting a major portion of mental health disorders.[1] According to Global Burden of Diseases, Injuries, and Risk Factors Study 2010, depressive disorders accounted for 40·5% of the total disability-adjusted life years (DALYs) caused by mental and substance use disorders.[2] A meta- analysis reported the worldwide prevalence rate of depressive disorders in elderly population between 4.7 to 16% with comparatively higher prevalence of 21.9% in India.[3] People with depression suffer from impairment of

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all major areas of functioning and die prematurely.[4] Patients over 55 years with depression have a four times higher death rate than those without depression.[5]

There is no no community based data available on the depression in the elderly from Haryana. This study was planned to provide a valuable addition to epidemiology of depressive disorders in the region. Therefore, we planned to ascertain prevalence of depression among elderly and assess its socio-demographic correlates in rural Haryana, north India.

Methods

This was a community based study with cross-sectional design, conducted during October, 2012 to August, 2013. Ethical approval was obtained from the Ethical Review Committee of Pt. B. D. Sharma University of Health Sciences, Rohtak.

Study setting

The study was conducted in the area of Community Health Centre (CHC), Chiri of Rohtak district of Haryana State (India). CHC, Chiri is an intensive field practice area of Pt. B. D. Sharma Postgraduate Institute of Medical Sciences. It had 24 villages and population of 1,05,983 as on 31st March 2012. We collected the list of 124 Anganwadi Centres (AWCs) in the study area, from the office of District Program Officer (Integrated Child Development Services Scheme), Rohtak. Each AWC provides mother and child health development services to population of around 800.

Study size and Sampling

The sample size for the study was determined using the formula ($n = DEEF*Z^2_{1-\alpha/2}\ p\ (1-p)/d^2$).[6] Design effect (DEEF) for cluster sampling was taken as 2. The Z is value of area under the normal curve (for two tailed) and α, level of significance was taken as 0.05. The 'p' was prevalence (11.6%),[3] and 'd' was absolute precision (4%). Thus, a sample size of 493 elderly people was estimated. Of the total 124 AWCs, 10 were selected randomly by the lottery method.

Study participants

A list of all elderly persons of both sex, aged 60 years and above, was prepared from the Survey Registers of AWCs. From each AWC, 50 elderly individuals were randomly selected using random number table; hence, 500 elderly were included in the study.

Exclusion criteria

Elderly individuals having aphasia, gross hearing impairment, articulation disorders were excluded from this study As; it was difficult to interview such patients due to speech and communication problems. The individuals from locked houses and those not contacted after three visits, were also excluded.

Data collection

The investigator was trained to use GDS-30 instrument in the community, and the data was collected by house-to-house visit. An informed written consent was taken from all the study participants. A standard questionnaire "Geriatric Depression Scale- 30 (GDS-30)" was used to screen the depression in study participants.[7] A valid Hindi language version of GDS-30 was readily available.[8] This tool with a cut off of 22 was used to classify as depression and non- depression.[9] In addition to GDS- 30, a pre-tested and semi- stuctured questionnaire was used to study socio-demographic profile, chronic morbidity, substance abuse, physical activity, living arrangement and other factors. The socioeconomic status of study population was measured using UdaiPareek scale for rural population.[10]

Any respondent, found positive for depression, was referred to the Psychiatry Outpatient Department of Pt. B.D. Sharma PGIMS, Rohtak at the earliest for a free consultancy and treatment.

Definitions

Elderly: Elderly were defined as the individuals with age at minimum 60 years.[11] Age of study participants was verified by Voter ID Card, Ration Card or Old Age Pension beneficiary card.

Economically Independent: Study participants were considered as 'economically independent' if they were leading economically productive lives; '**Partially Dependent**' if they were having a small income like an old age pension; and '**Totally Dependent**' if they were not getting any income.

Dependent on others for the day to day activities: A study participant was considered to be 'dependent on others for the day to day activities' if he/ she required any sort of help from others for the activities of daily living.

Physically Active: Elderly were taken 'physically active' if they could do household work regularly or involved in agriculture/ labour or any other such occupation.

Physically Inactive: A study participant was considered to be 'physically inactive' if he/she was able to conduct the activities of daily living on his/her own without requiring any sort of help from others, but did not do household work regularly or not involved in any occupation.

Chronic morbidity: It was taken as present if already diagnosed or self- reported by study participants. It included hypertension, diabetes mellitus, respiratory diseases, cardiac diseases, arthritis, stroke, cancer or any illness existed for duration of more than six month.

Day time spending engaged in work/ hobbies: It was defined as time spent during the day by elderly persons by doing household work, occupation, or hobbies like card playing, playing with grandchildren, gossiping with neighbours etc.

Statistical analysis

The data was analyzed using IBM SPSS Statistics for Windows, Version 22.0 (IBM Corp. Armonk, NY, USA). All the tests were performed at significance level of 5%, thus an association was significant if the 'p' value was less than 0.05. Categorical variables were presented as percentage (%). The variables with quantitative data were presented as mean (standard deviation). The Pearson's Chi-square test was used for categorical variables, and Student's *t*-test for quantitative data. The variables with p-value of less than 0.02 at bivariate analysis were included in the multivariate analysis for adjustment. Stepwise multiple logistic regression was used to find out an independent association of various factors with depression. The outputs of regression analysis were presented as adjusted Odds Ratio (OR) with 95% Confidence Interval (CI).

Results

A total of 500 elderly persons from 10 AWCs participated in our study. The mean age of study participants was 68.5 years (SD = 7.72). The sample had 46.2% males and 53.8% females. More than one third of our study participants were single; either unmarried (1.2%), or separated (0.6%), or widowed (33.4%). The majority (75.8%) of elderly persons studied below 5th standard and 71% were not involved in any occupation at the time of study. Of the total, 18.4% of study participants belonged to lower class, 43.2% lower middle, 32.4% middle class and 6% were from upper-middle and upper class.

In our study, the prevalence of depression in the elderly was 14.4% (95% CI: 11.6- 17.8). We used Geriatric Depression Scale (GDS-30) to screen depression with cut off score minimum 22. Mean score of GDS- 30 was 9.8 (SD = 8.4).

On bivariate analysis, a number of factors had significant association with depression in the elderly such as, female gender, being single (unmarried, widowed, and separated), educated below 5th standard, unemployed, lower socioeconomic status, economically dependent, not being consulted for major decisions in family, not engaged in any work or hobby, dependent on others for routine daily activities, chronic morbidity, sleep problems, and death of a close relative during last one year. No significant association of depression was found with the factors like type of family, living arrangement and substance abuse [Table 1].

After adjustment for various factors, female gender elderly not being consulted for major decisions in family, chronic morbidity, without work or hobbies, and death of a close relative in last one year, had an independent association with depression in the elderly [Table 2]. The odds ratios for these factors were adjusted to marital status, education, present occupation, socioeconomic status, economic dependency, physical activity, and sleep problems.

Discussion

We conducted a community based, cross sectional study in a rural population of district, Rohtak (Haryana, India). The prevalence of depression in the elderly was 14.4%. Similar prevalence was reported by Abhishek *et al.*[12] (2013),[13] Rajkumar *et al.* (2009),[14] and Yadav *et al.* (2013)[15] from India; Chen *et al.* (1999) from China; Ferreira *et al.* (2009) from Brazil,[16] and Eurodep studies (2004) conducted in European countries.[17] However, most studies from India and other Asian countries reported higher prevalence rate.[18-28] SHARE study (age≥50 years) from Europe reported depression in the elderly prevalence rate as 18%-37%.[29]

National cross-sectional study from South Africa and Canada reported low prevalence of depression.[30,31] This wide difference in the figures is largely due to sampling strategies, sample sizes, study setting and different instruments used in different studies.

We used Hindi version (Indian national language) GDS-30 with cut off of 22 to screen elderly population for depression. This scale was validated in Haryana, India by Ganguli *et al.*[9] Gupta *et al.* also used the GDS-30 with similar cut off among elderly with medical disorders in a geriatric clinic of North India and reported prevalence was 28%.[32] Being a hospital based study; it did not represent general population. This might led to selection bias and attributed to a higher prevalence of depression.

In our study, female gender, not consulted for major decisions in family, chronic morbidity, daytime spending without work or hobbies, and death of close relative in last one year had independent positive association with prevalence of depression in the elderly.

Women had 2.7 times higher prevalence of depression than men (19.3% vs. 7.4%) in present study, which was similar to other studies conducted in India, Canada, Sri Lanka and Pakistan. [22,23,31,33,34] Elder women face a triple jeopardy: that of being old, of being women and of being poor.[35] Loss of spouse for older women resulted in loss of status, insecurity and economic crisis.[36] Higher level of physical comorbidities further increase women's dependency on their family.[37]

Table 1: Prevalence of depression with socio- demographic variables of study population (N= 500)

Parameters		With depression (% or SD)	Without depression (% or SD)	P value
Mean age in years		68.1±7.7	68.6±7.7	0.616[a]
Mean GDS Score		25.2±2.3	7.2**±5.**9	0.000[a]
Gender	Male	20 (8.7)	211 (91.3)	0.001[b]
	Female	52 (19.3)	217 (80.7)	
Marital status	Unmarried, widowed, and separated	34 (19.3)	142 (80.7)	0.021[b]
	Married	38 (11.7)	286 (88.3)	
Education level	Below 5th standard	67 (17.7)	312 (82.3)	0.000[b]
	5th standard and above	05 (4.1)	116 (95.9)	
Present occupation	Unemployed	67 (18.9)	288 (81.1)	0.000[b]
	Employed	05 (3.4)	140 (96.6)	
Socioeconomic status	Upper, Upper MIddle, and Middle	13 (6.8)	179 (93.2)	0.000[b]
	Lower middle class	38 (17.6)	178 (82.4)	
	Lower class	21 (22.8)	71 (77.2)	
Economic dependency	Independent	06 (5.6)	102 (94.4)	0.003[b]
	Partially/ Totally dependent	66 (16.8)	326 (83.2)	
Type of family	Joint	52 (13.6)	330 (86.4)	0.367[b]
	Nuclear	20 (16.9)	98 (83.1)	
Living arrangement	Alone	3 (42.9)	04(57.1)	0.065[b]
	Not living alone	69 (14.0)	424 (86.0)	
Consulted for decisions in family	Yes	36 (9.8)	333 (90.2)	0.000[b]
	No	36 (27.5)	95 (72.5)	
Physical activity	Physically active	18 (6.5)	258 (93.5)	0.000[b]
	Lack of physical activity	40 (22.2)	140 (77.8)	
	Dependent for day to day activity	14 (31.8)	30 (68.2)	
Chronic morbidity	Present	56 (20.9)	212 (79.1)	0.000[b]
	Not present	16 (6.9)	216 (93.1)	
Substance abuse	Yes	22 (11.4)	171 (88.6)	0.130[b]
	No	50 (16.3)	257 (83.7)	
Daytime spending in work/ hobbies	Yes	40 (9.9)	365 (90.1)	0.000[b]
	No	32 (33.7)	63 (66.3)	
Sleep problems	Present	37 (20.8)	141 (79.2)	0.002[b]
	No present	35 (10.9)	287 (89.1)	
Death of close relative during last one year	Present	23 (24.7)	70 (75.3)	0.002[b]
	No present	49 (12.0)	358 (88.0)	

a = unpaired student t test; b = chi square test

Table 2: Multiple logistic regression analysis showing independent predictors of depression (N= 500)

Variables		aOR† (95% CI‡)	p value
Gender	Male	Reference	0.002
	Female	2.68 (1.44- 5.00)	
Consulted for decision in family	Yes	Reference	0.001
	No	2.67 (1.53- 4.66)	
Chronic morbidity	Not present	Reference	0.006
	Present	2.4 (1.28- 4.5)	
Daytime spending in work or hobbies	Yes	Reference	0.000
	No	3.84 (2.09- 7.05)	
History of death of close relative during last one year	Not present	Reference	0.031
	Present	1.98 (1.06- 3.69)	

† adjusted Odds Ratio (adjusted factors were given in text, Results Section)
‡ Confidence Interval

Elderly persons, those who were not consulted for major decision in their families, had about three times higher prevalence of depression in the present study. Maulik *et al.* (2012) also reported similar finding.[22] When, elderly holds an authoritative place in the family, they are shown obedience and loyalty by young family members and more care is provided to them. They do not have feeling of worthlessness, hopelessness or disability in this situation.[38]

In our study, depression was 2.4 times more prevalent in presence of comorbidities among elderly population similar to that reported from a tertiary hospital of Delhi.[39] In Sri Lanka, and Turkey, a significantly higher prevalence of depression in the elderly was reported in presence of chronic comorbidity.[33,40] In fact, relationship between depression and chronic comorbidities is bi-directional.[41] Depression is itself a risk factor for the development of chronic diseases and leads to their poor outcome. On the other hand, chronic diseases may also lead to depression.[42]

Elderly without daytime spending in work/ hobbies had about four times higher depression. Similar findings were reported in study by Sandhya (2010).[19] Work/ hobbies act as distractors for depressive thoughts and improve the person's self-esteem. Peer group at work place provide support and opportunity to share, which has a preventive role against development of depressive symptoms.[37,43]

We did not find significant relation of substance abuse with depression in the elderly contrary to findings of Jain *et al.* (2007).[23] However, Peltzer and Mafuya (2013) in a study from South Africa reported that tobacco and alcohol use had no significant association with depression.[30] The presence of substance abuse in our study population is not due to stress or depression, but might be because of the traditional cultural practices of hukkah (water pipe smoking), which is quite prevalent in the rural area of Haryana.

There was two times higher depression in those elderly, who had history of death of a close relative during last one year. Barua *et al.* also reported the same findings .[18] Cole *et al.* (2003) and Blazer *et al.* (2005) reported bereavement as a significant risk factor for depression in the elderly.[44,45] Death of a close relative, especially son, is devastating in elder people life in the Indian culture. After the death of an earning member, elderly have to bear the responsibility of the whole family and face financial problems.

Limitations

First, we had not excluded those elderly who were affected by cognitive impairment. This may have provided false cases of depression. Second, we relied on self- reported or already diagnosed chronic morbidities only. Therefore, the true prevalence of chronic morbidities was not assessed. Third, we did use diagnostic tool to confirm the diagnosis due to logistic reasons. However, the GDS-30 is commonly used for studying depression in the community based settings.

Conclusion

The prevalence of depression in the elderly was 14.4% in a rural population of north India. Female gender, chronic morbidity, ignorance of elderly in household decision making, daytime spending without work or hobbies, and death of close relatives were identified as significant risk factors of depression in the elderly.

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Conflicts of interest

There are no conflicts of interest.

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