Short Communication

Vol. 10, No. 2, 102-109
https://doi.org/10.15280/jlm.2020.10.2.102

Journal of Lifestyle Medicine

Moving Out of Shadows: Depression among the Elderly in Dehradun District of Uttarakhand, India

Kritika Tiwari[1], Pradeep Aggarwal[2,*], Rakesh Kakkar[3], Ashitabh Tiwari[4]

[1]Department of Community Medicine, MGM Medical College and LSK Hospital, MG University, Kishanganj, Bihar, [2]Department of Community and Family Medicine, All India Institute of Medical Sciences (AIIMS), Rishikesh, Uttarakhand, [3]Department of Community and Family Medicine, AIIMS Mangalagiri, Andhra Pradesh, [4]Department of Psychiatry, MGM Medical College and LSK Hospital, MG University, Kishanganj, Bihar, India

Background: Depression, a stigma swept under the rug, has morphed to be tabbed as the theme of World Health Day 2017 by the World Health Organization (WHO). Depression in old age is stereotypically tethered to the ageing process but it is a medical problem that has been under-researched. This study was conducted to estimate the point prevalence of depression among the elderly in Dehradun district of Uttarakhand and to identify its predictor variables.

Methods: It was a cross-sectional study conducted in Dehradun district of Uttarakhand (India) among 660 elderlies (≥60 years) from three strata (rural, urban and special groups). The Hindi version of long form of Geriatric Depression Scale (GDS-H) was used to identify mild and severe depression. All statistical analyses were carried out by SPSS software (version 22) at 5% level of significance.

Results: The arithmetic mean (±SD) of GDS scores was 10.62 (±6.1). 55% elderly were found to be suffering from depression (46.8% mild and 8.2% severe depression). Bivariate analysis showed significant association of depression with increasing age, female gender, place of residence, type of family, living without spouse, financial dependency, involvement in any kind of substance abuse and suffering from some chronic morbidities like osteoarthritis, chronic respiratory illness, skin diseases, visual impairment or hearing impairment. These predictor variables were further subjected to multivariate analysis.

Conclusion: The high prevalence of depression in old age and its multifactorial association tags it as a public health problem in this age group which should be recognized and managed before it becomes a health menace.

Key Words: Depression, Elderly, Geriatric Depression Scale, Hindi version (GDS-H)

INTRODUCTION

There has been an age-old quest for achieving mental health. “Chitta vritti nirodha” is a yogic sutra which means bringing the mind to the state of tranquillity [1]. Mental health is an integral part of well-being as evident from the WHO definition of health [2]. Mental illnesses follow the iceberg phenomenon, impart no immunity, negatively affect almost every aspect of patients’ life and are emerging as a challenge to public health. This silent threat was highlighted by the World Health Day theme of 2001 (mental health:

Received: February 14, 2020, Accepted: June 10, 2020

*Corresponding author: Pradeep Aggarwal
Department of Community and Family Medicine, All India Institute of Medical Sciences (AIIMS), Virbhadra Road, Rishikesh, Uttarakhand 249203, India
Tel: 91-9837-215747
E-mail: drpradeep_aggarwal@hotmail.com

stop exclusion - dare to care) [3].

Depression is one of the most prevalent mental disorders of public health importance affecting mental, physical as well as social well-being and can lead to dolour and torment. It is a mood disorder characterised by a multitude of symptoms like feeling of sadness, guilt, worthlessness, tiredness, low self-esteem, difficulty in concentrating, loss of interest along with altered sleeping and eating behaviours. It can be mild, moderate or severe and may lead to suicide [4]. The mechanism of depression is the synergy between various biological, psychological and social factors. It affects more than 300 million people globally. Between 2005 and 2015, the prevalence of depression has increased by 18%. In India, approximately 5% of the population or 1 in every 20 Indians suffers from this condition [5,6]. Once a stigma swept under the rug, depression has morphed to be tabbed as the theme of World Health Day 2017 by the World Health Organization (WHO) [7].

The prevalence of psychiatric illnesses was found to be much higher (43.32%) in geriatric group as compared to non-geriatric group (4.66%), with depression being the most common psychiatric morbidity in a study done in rural Northern India [8]. Moreover, the continuous increment in geriatric population will cause a two-fold increase in the number of elderly from the year 2015 to 2050 (12% to 22%) with 80% senior citizens residing in middle and low income countries [9]. Community based studies have shown a wide range from 8.9% to 62.16% in the prevalence of depression in geriatric population [10]. Depression in old age is stereotypically tethered to the ageing process but it is a medical problem that has been under-researched. The geriatric population is a psychologically vulnerable group because of societal, economical and behavioural changes like dependency, frailty, fast eroding traditional family system, rapid modernization, urbanization and negative ageist attitudes. The limited infrastructure, deficiency of specialists (psychiatrists) and lack of training in geriatric care add to the problem [11]. Hence, depression in old age is an underdiagnosed and under-treated condition.

This study was done to estimate the point prevalence of depression among the elderly in Dehradun district of Uttarakhand and to identify its predictor variables.

MATERIALS AND METHODS

This community based cross-sectional study was conducted among the elderly population (aged ≥ 60 years) residing in Dehradun district of Uttarakhand (India). Taking the prevalence of depression among the elderly as 16.3%, allowable error 5% at 95% confidence interval and 5% non-response rate, the sample size was calculated as 220 by the formula $\frac{1.96^2pq}{l^2}$ [12]. For a good representation of the total geriatric population of Dehradun district, the study population was divided into three strata [Rural, Urban and Special Groups (the elderly from Day care centre and retired army personnel & their spouses)] and 220 subjects from each group were selected for the study by stratified random sampling making a total sample size of 660.

Multistage random sampling was applied to select subjects from rural and urban groups. The first step comprised of selecting blocks from rural areas and municipalities from urban areas. Out of six blocks and four municipalities in Dehradun district, one block and one municipality were randomly selected. The second step comprised of selecting Nyay Panchayats and villages from rural block and wards from urban municipality. Out of five Nyay Panchayats, one was selected randomly from which four villages were selected by random sampling by Microsoft excel 2010. Two urban wards out of twelve were randomly selected. The number of subjects selected was divided equally between villages (i.e. 55 from each village) as well as between wards (110 from each). Special groups consisted of 110 elderlies from a Day care and recreation centre for senior citizens in Dehradun and 110 retired army personnel & their spouses living in Dehradun city. These elderly were institutionalized/organized in one way or the other. The members of Day Care Centre participate in different psychologically satisfying and socially meaningful activities. The facilities and activities included fitness awareness, health services, library facility, indoor games, recreational activities, picnics, legal advice, computer & internet learning, meditation & spiritual discourse, cultural programmes etc. The special group from army background was living in good conditions with better social and financial security as compared to the general population. Hence, special groups were included in the study

to compare with the unorganized sector of elderlies from the general community. The selection of eligible subjects from rural, urban and army background was done by consecutive sampling till the accomplishment of sample size. Only one elderly was selected from each house. For recruiting elderly from Day Care Centre, health camps were organized and first 110 members who gave consent were included in the study.

Permission from institution's ethics committee was taken prior to the inception of study. Subjects were included in the study after taking written informed consent. Males and females ≥ 60 years of age, who were willing to participate and were able to answer, were included from the selected places whereas mentally ill elderly, those not able to answer and those who did not give consent were excluded. The study tools were a self-structured questionnaire on socio-demographic variables and morbidity profile and the Hindi version of long form of Geriatric Depression Scale (GDS-H). Relevant clinical examination was also done. Geriatric Depression Scale (GDS) is a self-reported measure of depression in older adults. Users respond in a "Yes/No" format to a set of 30 questions. It is a reliable and validated depression screening scale for the elderly populations. Scoring was done and subjects were classified as normal, having mild depression or severe depression [13-15].

Statistical analyses were done by using both descriptive and inferential statistics by SPSS-22 software. Data were presented in tables and graphs made by Microsoft excel

Table 1. Socio-demographic determinants of depression in old age

Determinants of depression	Depression			χ^2 value	df	χ^2 p-value
	No	Mild	Severe			
	No. (%)	No. (%)	No. (%)			
Age (years)						
60-79 (n = 617)	288 (46.7)	285 (46.2)	44 (7.1)	19.49	2	**<0.001**
80-99 (n = 43)	9 (20.9)	24 (55.8)	10 (23.3)			
Gender						
Male (n = 362)	189 (52.2)	151 (41.7)	22 (6.1)	18.06	2	**<0.001**
Female (n = 298)	108 (36.2)	158 (53.0)	32 (10.7)			
Study group						
Rural (n = 220)	80 (36.4)	103 (46.8)	37 (16.8)			**<0.001**
Urban (n = 220)	54 (24.5)	152 (69.1)	14 (6.4)	145.54	4	
Special (n = 220)	163 (74.1)	54 (24.5)	3 (1.4)			
Education						
Illiterate (n = 213)	53 (24.9)	122 (57.3)	38 (17.8)	71.49	2	**<0.001**
Literate (n = 447)	244 (54.6)	187 (41.8)	16 (3.6)			
Religion						
Hindu (n = 645)	287 (44.5)	305 (47.3)	53 (8.2)	2.98	2	0.23
Others (n = 15)	10 (66.7)	4 (26.7)	1 (6.7)			
Marital status						
Currently married (n = 471)	250 (53.1)	189 (40.1)	32 (6.8)			**<0.001**
Unmarried/separated/divorced/widowed (n = 189)	47 (24.9)	120 (63.5)	22 (11.6)	43.45	2	
Type of family						
Nuclear (n = 126)	74 (58.7)	41 (32.5)	11 (8.7)	13.36	2	**0.001**
Joint (n = 534)	223 (41.8)	268 (50.2)	43 (8.1)			
Financial dependency						
Dependent (n = 331)	96 (29.0)	194 (58.6)	41 (12.4)	71.83	2	**<0.001**
Independent (n = 329)	201 (61.1)	115 (35.0)	13 (4.0)			
Substance abuse						
Yes (n = 214)	80 (37.4)	109 (50.9)	25 (11.7)	9.97	2	**0.007**
No (n = 446)	217 (48.7)	200 (44.8)	29 (6.5)			

2010. Mean and standard deviation was calculated for continuous variables. Categorical variables were summarized in percentages and presented in tables or graphs. Bivariate analysis followed by multivariate analysis was done to explore the predictors of depression.

RESULTS

Out of total 660 subjects, 362 (54.8%) were males and 298 (45.2%) were females. The mean age of the study subjects was 67.78 (±6.7 years). Maximum numbers of respondents were in the age groups 60-65 years and 66-75 years with a marginal difference in percentage, viz. 37.6% and 40.8% respectively. 93.5% of the subjects were less than 80 years of age. 67.7% of the study subjects were literate. Most of the respondents were Hindu by religion, 80.9% of the elderly lived in a joint family and 72.1 % had their spouse alive. There were almost equal numbers of financially independent (49.8%) and financially dependent (50.2%) subjects. 32.4% of the subjects were involved in substance abuse in any form.

The arithmetic mean (±SD) of GDS scores was 10.62 (±6.1) with a range of 26. 55% of the elderly, i.e. 363 elderly, were found to be suffering from depression with 309 (46.8%) having mild and 54 (8.2%) having severe depression.

Table 1 shows the association between various socio-demographic variables and depression among the geriatric population studied. Increasing age was found to be significantly associated with depression with more prevalence of mild as well as severe depression with increasing age. Both mild and severe forms of depression were found to be more in females (53% and 10.7%) as compared to males (41.7% and 6.1%) and this difference was found to be statistically significant. Special group had the least number of old people suffering from depression (25.9%), followed by rural group (63.6%) and maximum percentage was seen in urban group (75.5%). Mild depression was more common in urban group (69.1%) and severe depression in rural group (16.8%). More percentage of illiterate elderlies were found to be suffering from depression (mild as well as severe) as compared to literate ones. Religion was not found to be significantly associated with depression. Marital status was found to be significantly associated with depression with currently married elderly showing lesser occurrence of mild and severe depression as compared to those who were either unmarried or

Table 2. Relation between depression and chronic morbidities among the study population

Chronic morbidity	Depression			χ^2 value	df	χ^2 p-value*
	No	Mild	Severe			
	No. (%)	No. (%)	No. (%)			
Osteoarthritis						
Yes (n = 323)	103 (31.9)	190 (58.8)	30 (9.3)	44.59	2	**<0.001**
No (n = 337)	194 (57.6)	119 (35.3)	24 (7.1)			
Chronic respiratory illness						
Yes (n = 226)	57 (25.2)	143 (63.3)	26 (11.5)	54.39	2	**<0.001**
No (n = 434)	240 (55.3)	166 (38.2)	28 (6.5)			
Skin diseases						
Yes (n = 79)	14 (17.7)	54 (68.4)	11 (13.9)	27.35	2	**<0.001**
No (n = 581)	283 (48.7)	255 (43.9)	43 (7.4)			
Visual impairment						
Yes (n = 460)	196 (42.6)	217 (47.2)	47 (10.2)	9.66	2	**0.008**
No (n = 200)	101 (50.5)	92 (46.0)	7 (3.5)			
Hearing impairment						
Yes (n = 192)	48 (25.0)	117 (60.9)	27 (14.1)	47.04	2	**<0.001**
No (n = 468)	249 (53.2)	192 (41.0)	27 (5.8)			

*Only significant morbidities ($p < 0.05$) have been shown.

separated or divorced or widowed. Depression was more common in elderlies residing in joint families. Mild depression was more common in those living in joint families (50.2%) whereas severe depression in nuclear families (8.7%). Financial dependency was seen to increase the number of cases of mild as well as severe depression. Those elderly who were involved in any kind of substance abuse were found to be more at risk of developing depression as compared to their counterparts without these habits.

On examining the relation between chronic morbidities

Table 3. Logistic regression of depression on predictor variables among the study population

Predictor variables	B		SE		OR		95% CI		p-value	
	MD	SD	MD	SD	MD	SD	MD	SD	MD	SD
Age (years)										
60-79	−.79	−2.06	.60	.64	.45	.13	.18-1.16	.04-.45	.09	.001
80-99	Reference category*									
Gender										
Male	−.19	−.42	.25	.45	.83	.66	.51-1.34	.27-1.59	.44	.35
Female	Reference category									
Study group										
Rural	.78	2.37	.28	.72	2.18	10.68	1.27-3.76	2.59-44.06	.005	.001
Urban	1.30	1.29	.27	.73	3.66	3.64	2.13-6.26	.87-15.17	<0.001	.08
Special	Reference category									
Education										
Illiterate	.55	1.25	.26	.44	1.72	3.50	1.04-2.87	1.47-8.33	.04	.005
Literate	Reference category									
Marital status										
Currently married	−.89	−1.04	.23	.38	.41	.36	.26-.65	.17-.75	<0.001	.01
Unmarried/separated/ divorced/widowed	Reference category									
Type of family										
Nuclear	−.01	.70	.26	.47	.99	2.0	.59-1.66	.80-5.03	.96	.14
Joint	Reference category									
Financial dependency										
Dependent	.34	.38	.25	.48	1.41	1.45	.86-2.31	.57-3.73	.18	.44
Independent	Reference category									
Substance abuse										
No	−.48	−1.06	.23	.42	.62	.35	.39-.97	.15-.79	.04	.01
Yes	Reference category									
Osteoarthritis										
Yes	.62	.30	.20	.36	1.85	1.35	1.25-2.75	.67-2.73	.002	.40
No	Reference category									
Chronic respiratory illness										
Yes	.54	.96	.23	.39	1.71	2.61	1.09-2.68	1.22-5.56	.02	.01
No	Reference category									
Skin diseases										
Yes	.59	1.05	.35	.51	1.80	2.87	.91-3.59	1.06-7.77	.09	.04
No	Reference category									
Visual impairment										
Yes	.08	1.13	.21	.47	.93	3.08	.61-1.4	1.24-7.70	.72	.02
No	Reference category									
Hearing impairment										
Yes	.45	.89	.23	.38	1.57	2.43	.99-2.48	1.16-5.08	.053	.02
No	Reference category									

*Reference category: the group from each variable which was used to compare other groups in logistic regression analysis.
B: Regression coefficient, SE: Standard error, OR: Odds Ratio, CI: Confidence Interval, MD: Mild depression, SD: Severe depression.

and depression, it was seen that osteoarthritis, chronic respiratory illnesses, skin diseases, visual impairment and hearing impairment were significantly associated with depression (Table 2).

The predictor variables which were found significant in bivariate analysis ($p < 0.05$) were subjected to multivariate analysis. The test of parallel lines was violated on performing ordinal regression. Hence, multinomial logistic regression was then applied by SPSS software. The results have been summarised in Table 3. The model was found to be statistically significant with p-value < 0.001. The goodness of fit statistics showed a satisfactory fit for the model. The Nagelkerke pseudo R-square was 0.416, which meant that 41.6% of the variance in the dependent variable (depression) was explained by this model. The predictors of mild depression that were found to be significant were living in rural and urban areas, being illiterate, not living with spouse (being unmarried, separated, divorced or widowed), being involved in any form of substance abuse, suffering from osteoarthritis or chronic respiratory illness. Similarly, the predictors of severe depression that were found to be significant on multivariate analysis were increasing age, living in rural areas, being illiterate, not living with spouse (being unmarried, separated, divorced or widowed), being involved in any form of substance abuse, suffering from chronic respiratory illness, skin disease, visual impairment or hearing impairment.

DISCUSSION

In the present study conducted among three strata of elderly population (rural, urban and special groups) from Dehradun district, the mean age of the participants was 67.78 (±6.7) years which was less as compared to a study done in Nepal [16]. In this study, the arithmetic mean (±SD) of GDS scores was computed as 10.62 (±6.1) with a range of 26. The overall prevalence of depression among the study population was found to be 55%. The point prevalence of mild depression was 46.8% and that of severe depression was 8.2%. These percentages were higher as compared to another study done by Nautiyal et al. [17]. Differences were found in the prevalence of depression among the three groups studied in this research. The overall prevalence of depression in the rural area was high (83.2%). It is very high as compared to other studies done in other rural areas of India [18-20]. Mild depression was found in 46.8% of the subjects and severe depression in 16.8% in the present study. The prevalence of mild depression was lower than that found in a study by Dighe et al. (51.5%) [20] and severe depression was lower as compared to that in a study by Radhakrishnan et al. (21%) [18]. In urban group, the prevalence of depression was 75.5% with mild depression being 69.1% and severe depression 6.4%. As special groups were involved in socially productive activities and had better access to health care, depression was found to be least among this group, accounting to only 25.9% with majority in milder form and only 1.4% severe depression. Studies done in old age homes by Chalise and Goud et al. have found the prevalence of depression to be 57.8% and 53.75% respectively [16,21].

Bivariate analysis showed significant association of depression with increasing age, female gender, place of residence, type of family, living without spouse, financial dependency, involvement in any kind of substance abuse and suffering from some chronic morbidities like osteoarthritis, chronic respiratory illness, skin diseases, visual impairment or hearing impairment. These predictor variables were further subjected to multivariate analysis. The predictors of mild depression that were found to be significant were living in rural and urban areas, being illiterate, not living with spouse (being unmarried, separated, divorced or widowed), being involved in any form of substance abuse, suffering from osteoarthritis or chronic respiratory illness. Similarly, the predictors of severe depression that were found to be significant on multivariate analysis were increasing age, living in rural areas, being illiterate, not living with spouse (being unmarried, separated, divorced or widowed), being involved in any form of substance abuse, suffering from chronic respiratory illness, skin disease, visual impairment or hearing impairment. These results were consistent with the findings of other studies [16,18-20,22-24]. Some studies have found depression to be associated with hypertension and diabetes mellitus which was not found to be significant in our study [25].

CONCLUSION

More than half of the elderly were found to be suffering from depression which was quite alarming. It was shown to have multifactorial association with the possible predictors of depression being increasing age, female gender, place of residence, type of family, living without spouse, financial dependency, involvement in any kind of substance abuse and suffering from some chronic morbidities like osteoarthritis, chronic respiratory illness, skin diseases, visual impairment or hearing impairment. Mild and severe depression had slightly different predictors among these. These factors tag it as a public health problem in this age group which should be recognized and managed before it becomes a health menace.

CONFLICTS OF INTERESTS

None to declare.

REFERENCES

1. Gururaj G, Varghese M, Benegal V, Rao GN, Pathak K, Singh LK, Mehta RY, Ram D, Shibukumar TM, Kokane A, Lenin Singh RK, Chavan BS, Sharma P, Ramasubramanian C, Dalal PK, et al. National Mental Health Survey of India, 2015-16: Summary. Bengaluru: National Institute of Mental Health and Neuro Sciences, NIMHANS, 2016 Publication No. 128.
2. Park K. Mental Health. Park's Textbook of Preventive and Social Medicine. 24th ed. Jabalpur: Banarsidas Bhanot. 2017. pp.868-75.
3. WHO. World Health Day 2001 [cited 2017 2nd Feb.]. Available from: http://www.who.int/world-health-day/previous/2001/en/.
4. WHO. Depression [cited 2017 3rd Jan.]. Available from: http://www.who.int/topics/depression/en/.
5. Iyer M. 7.5% Indians suffer from mental disorders: WHO report. The Times of India. 2017 25th Feb, 2017.
6. WHO. Depression: Fact sheet 2017 [updated Feb. 2017; cited 2017 26th Feb.]. Available from: http://www.who.int/mediacentre/factsheets/fs369/en/.
7. WHO. World Health Day - 7 April 2017 Depression: Let's talk 2017 [cited 2017 21st March]. Available from: http://www.who.int/campaigns/world-health-day/2017/en/.
8. Tiwari SC. Geriatric psychiatric morbidity in rural northern India: implications for the future. *International psychogeriatrics* 2000;12(1):35-48.
9. Nations U. World Population Prospects: The 2015 Revision, Key Findings and Advance Tables. New York: United Nations, Department of Economic and Social Affairs PD; 2015 Working Paper No. ESA/P/WP.241.
10. Grover S, Malhotra N. Depression in elderly: A review of Indian research. *Journal of Geriatric Mental Health* 2015;2(1):4-15.
11. Pilania M, Bairwa M, Kumar N, Khanna P, Kurana H. Elderly depression in India: An emerging public health challenge. *Australas Med J* 2013;6(3):107-11.
12. Seby K, Chaudhury S, Chakraborty R. Prevalence of psychiatric and physical morbidity in an urban geriatric population. *Indian J Psychiatry* 2011;53(2):121-7.
13. APA. Geriatric Depression Scale (GDS): American Psychological Association; [cited 2016.9th.Sept.]. Available from: http://www.apa.org/pi/about/publications/caregivers/practice-settings/assessment/tools/geriatric-depression.aspx.
14. Yesavage JA, Brink TL, Rose TL, Lum O, Huang V, Adey M, Leirer VO. Development and validation of a geriatric depression screening scale: a preliminary report. *J Psychiatr Res* 1983;17:37-49.
15. Ganguli M, Dube S, Johnston JM, Pandav R, Chandra V, Dodge HH. Depressive symptoms, cognitive impairment and functional impairment in a rural elderly population in India: a Hindi version of the geriatric depression scale (GDS-H). *Int J Geriatr Psychiatry* 1999; 14(10):807-20.
16. Chalise H. Depression among elderly living in Briddashram (old age home). *Adv Aging Res* 2014;3: 6-11.
17. Nautiyal A, Madhav N.V.S, Ojha A, Sharma RK, Bhargava S, Kothiyal P, Prevalence of Depression among Geriatric People in Dehradun City of Uttarakhand, India. *Indian J Depress Anxiety* 2015;4: 208.
18. Radhakrishnan S, Nayeem A. Prevalence of depression among geriatric population in a rural area in Tamilnadu. *Int J Nut Pharmacol Neurol Dis* 2013;3: 309-12.
19. Arumugam B, Nagalingam S, Nivetha R. Geriatric depression among rural and urban slum community in Chennai: A cross sectional study. *J Evol Med Dent Sci* 2013;3:795-801.
20. Dighe SV, Gawade EM. Depression among rural elderly population. *Sinhgad E J Nurs* 2012;2:18-22.
21. Goud AA, Nikhade SN. Prevalence of depression in older adults living in old age home. *IAIM* 2015;2(11):1-5.
22. Seby K CS, Chakraborty R. Prevalence of psychiatric and physical morbidity in an urban geriatric population. *Indian J Psychiatry* 2011;53:121-7.

23. Dumbray SS, Kale S, Jadhav A, Neetu PV. A descriptive study to assess prevalence of depression among geriatric group. *Asian J Multidiscip Stud* 2014;2(72):72-82.
24. Nair SS, Hiremath S. Depression among geriatrics: Prevalence and associated factors. *Int J Curr Res Rev* 2013;5:110-2.
25. Sundru MB, Goru KB. Epidemiological study of depression among population above 60 years in Visakhapatnam, India. *Int J Med Sci Public* 2013;2:695-702.