



Functionality and Depression in Late Life

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ABSTRACT

Old age can be a bliss as well as curse. Physical health and mental health cannot be separated from each other; deterioration in physical health may result into negative thought processes and vice versa. In this research an attempt was made to understand the relation between functionality and depression. A sample size of 1016 older people was taken from Delhi and NCR. Modified Lachs Protocol for Activities of Daily Living (ADL) score, the instrumental activities of daily living score (IADL) and GDS was used for assessment. A significant difference at $p < 0.5$ found in IADL at 70+ and significant difference at $p < 0.5$ in ADL at the age of 80 and above. It is found that functionality in terms of ADL and IADL reduces with age however depression varies with different sociological and cultural factors.

Keywords: Biological factors and depression, Depression among elderly, Functionality and depression, Socio-cultural factors and depression.

INTRODUCTION

“Mental health and physical health both are equally important for the overall well-being of people living in any society or country. Advances in neuroscience and behavioral sciences medicine have shown that, like many physical illnesses, psychological and behavioral disorders are the result of a complex interaction between biological, psychological and social factors”.¹

The loss of function and disability in old age is a dynamic social phenomenon that relate to the individual’s physiological and psychological conditions in the milieu of their socioeconomic position, cultural norms and broader environmental contexts.^(2, 3) Aging raises a host of

fascinating issues which have come into focus due to the increasing share of older people in the Indian society.⁽¹⁴⁻¹⁷⁾ Although depression is not a part of aging but less severe depression is accepted in old age as a response to the life stressors.⁽⁴⁻⁹⁾ The concept of ageing is relative and highly subjective. Ageing is perceived differently by different people. In the 21st century it is more a social construct and is defined differently in different cultural and social contexts, along with it, tremendous advancement in medical and technological field is also changing the perception of society towards aging¹⁸. An athlete of 30 years feels old; several institutions consider the 60 years of age as the retirement age; menopause is considered by many women as a gateway to old age even if they are chronologically only 40 years.⁽¹⁰⁻¹²⁾ That is why age nowadays is more a social construct rather than physiological.¹⁸

Functionality – what does it mean?

Functionality is also a subjective concept which is relative to an individual person and his actual and perceived role. It may be visualized as not merely an absence of impairment, handicap, disease or disability but a state of complete ability to function with a sound mind and body in a suitable physical and social environment.¹³ Thus functionality is not merely an ability to carry out physical life functions but also a state of total mental and psychological health that allow an individual to function in his environment to be socially and personally independent besides being able to contribute to the advancement of the society in which he lives³.

Depression

People lose most of their life in raising children and pursuing careers. Therefore old age is a period of rest, reflection and opportunity to involve in things of interest. But unfortunately, golden years are not always so gainful. Later life is associated with events such as chronic and prolonged medical diseases,⁽³⁰⁻³²⁾ loss of friends and loved ones and the inability to take part in activities of interest. It hits not only physical well-being but also emotional well-being of an individual.⁽²²⁻²⁷⁾ In US 34 million older people aged 60+ are suffering from depression¹⁹. Most of the times people are not aware of signs of depression or are fearful of admitting it because of social stigma attached to mental illness in old age.²⁰

Deterioration in physical health such as sense a loss of control over his or her life due to poor eyesight, hearing impairment, loss of muscle strength, wrinkles on body and other physical changes, often multiplies with external pressures such as limited financial resources and poor relations with family members.^(20, 35) Such circumstances often generate negative emotions such as sadness, anxiety, loneliness and lowered self-esteem, which in turn lead to social withdrawal and apathy²¹.

Chronic depression is more recurring and persistent and is found to be highly associated with level of satisfaction. It has both physical and mental consequences that may complicate an older adult's existing health condition and give rise to new problems.³⁵ Many studies suggest that lower concentrations of foliate in the blood and nervous system may contribute to depression and dementia. It has effects on life satisfaction, mortality rate, cardiovascular diseases^(36, 29) and rate of recovery from diseases. In addition to biological deterioration and co-morbidities⁽³⁰⁻³²⁾ the

feelings of hopelessness and isolation that often trigger thoughts of suicide³³ among older adults.³⁴

Potentially harmful effects of depression affect the functional status of older people in many ways. Depression not only obstructs hope and optimism³⁹ to solve daily hurdles of life but also instigates negative thought processes which results into irritating behavior, blaming attitude, constraints in interpersonal relationships.⁴⁵ The intensity of the problem doubled due to its association with high rate of dependency both physical and economic on related others. That is why depression affects the life of the individual suffering with it as well as of those who are related to him in one or the other way.⁽⁴¹⁻⁴³⁾ Depressed older adults also suffer from insomnia and memory loss.⁴⁰ Usually they have longer than normal reaction times, increasing the possibility of hazards associated with cooking, driving, self-medication and other tasks that require full awareness.⁴⁴ Therefore this study is an attempt to understand the relationship of functional status, socioeconomic and cultural factors with depression in late life.

METHODOLOGY The present study was a prospective cross sectional study assessing the functional status of 1016 older individuals at a given point in time. This was a community-based study conducted in the National Capital Region of Delhi.

OBJECTIVES

1. To assess the prevalence of depression across older people of different age, gender, marital status, living arrangement and socioeconomic status.
2. To assess the relationship between functional status and depression.

Inclusion criteria

In this research study all the people of 60 years and above from upper middle and lower socioeconomic class are included.

Exclusion criteria

Older people who were below the age of 60 years and came to Delhi just to spend holidays with their children at the time when interviews were conducted but were not the permanent residents of Delhi are excluded from the study.

Tools

Modified Lach protocol for IADL and ADL

Geriatric Depression scale Procedure for data collection

The present study was conducted between 2005 and 2008, in a semi-urban lower and middle socio-economic class population in Delhi. It was a task force project funded by Indian Council of Medical Research to All India Institute of Medical Sciences (New Delhi) and Department of Psychology (University of Delhi).

The subjects were first identified through the voter list issued by the government of National Capital Territory of Delhi. The prospective sample was defined from the voters list and subjects were identified by random sampling with reasonable scope in case of absence and death of the

identified subject. Consent was taken from the subjects and their family after explaining to them, the objectives of the study, its methodology, advantages and disadvantages besides giving them the option to refuse to participate. The subjects were visited first by one of the research team (clinical group or psychology group).

First the subjects were made at ease through a rapport building process so that the subjects can express their mind without anxiety and doubt of being strangers talking to them. All the doubts of the subjects were clarified if any before administering the questionnaires. On the first visit, the research team established a rapport with the subject and the family and collected information on personal identification, education, socioeconomic status, family income, family structure, family environment, access to social services, access to health services and health care practices etc. Subsequently, each research team followed its protocol (prescribed questionnaires). After completion of its set of questionnaires the case/family was introduced to the second team.

The questionnaires were all administered by visiting two or three times to the respondent's residence depending upon the level of fatigue and comfort of the respondent. To avoid making the assessment process tiring and monotonous, the questionnaires were administered in an informal setting. To prevent the person from becoming overwhelmed by the questions in the assessment procedure, an effort was made to elicit the needed information in the course of the conversation itself.

Distribution of the population

Distribution of population (N=1016) characterized on the basis of age, gender, marital status, living arrangement and education. The age was categorized into five groups-Young-Old (60-65 years), Old (65-70 years) and Old-Old (71-75 years), Older-Old (76-80) and Oldest-Old (81+). The population was divided on the basis of gender namely male and female. The whole population was categorized into three groups illiterate, primary/ secondary and graduate and above on the basis of education. The marital status was categorized as married with spouse living, married but widowed and alone/never married.

ANALYSIS

Profile of physical function of population

The functional profile of the older individuals was evaluated using the Modified Lachs Protocol for Activities of Daily Living (ADL) score and the instrumental activities of daily living score (IADL) to determine the functionality in daily life. Most of the indicators of functionality show a significant difference across the age categories used to study the older subjects. In the current study 864 (85%) of the individual subjects were independent and 152 (15%) had limited dependence. In the current study it is found that 376 (37%) subjects were completely independent in incremental activities of daily living whereas 40 (3.9%) were totally dependent on others, 600 (59.1%) had limited dependence for incremental activities of daily living. The

results show that 34% older people were depressed and 91.8% reported incontinence. Table I provides a parameter of functional independence from young old to oldest old. The parenthesis indicate the standard deviation of observations recorded in the particular age category. The variables marked * indicate those that are statistically significant within the age groups as compared to the baseline category of 60-69 years using one way ANOVA, using Bonferroni Post Hoc test with $p < 0.5$.

Table- I Functional status of the study population (n=1016)

	60-64 (n=501)	65-69 (n=281)	70-74 (n=107)	75-79 (n=78)	80+ (n=49)	Total (n=1016)
Total IADL	6.28(2.47)	6.11(2.47)	5.46(2.37)*	5.18(2.21)*	4.04(2.66)*	5.75(2.45)
ADL Score	19.72(1.37)	19.47(1.73)	19.47(1.69)	19.22(2.42)	18.41(3.55)*	19.43(1.96)

Legend for table I: Data is presented as mean (\pm standard deviation). The variables marked # indicate those that are statistically significant across the age groups with $p < 0.5$.

Profile of Psychological function – Depression

The data collected on self reported depression shows depression in 34% (345 subjects) population from the sample studied. Table II shows the results of data collected by administering GDS 67.2% older people were in a normal range, 16.3% had mild depression and 16.4% had severe depression.

Table- II Depression across various age groups

Age categories	Depression		
	Normal	Mild depression	Severe Depression
Age 60 - 64	247(24.3)	55(5.4)	56(5.5)
Age 65 - 69	171(16.8)	42(4.1)	32(3.1)
Age 70 - 74	145(14.3)	38(3.7)	45(4.4)
Age 75 - 79	49(4.8)	12(1.2)	26(2.6)
Age 80 +	71(7.0)	19(1.9)	8(0.8)

Total	683(67.2)	166(16.3)	167(16.4)
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Legend: data presented in the table shows frequency (percentage) of the population studied.

The results shown in (Table III) are the comparison of gender on depression. It is found that 9% woman and 7.5% men are under severe depression however 7.7% females and 8.7% males are under mild depression

Table- III Depression across gender

	Depression		
	Normal	Mild depression	Severe Depression
Female	354(34.8)	78(7.7)	91(9.0)
Male	329(32.4)	88(8.7)	76(7.5)
Total	683(67.2)	166(16.3)	167(16.4)

Legend: data presented in the table shows frequency (percentage) of the population.

Table-IV Depression across marital status

Marital statuses	Depression		
	Normal	Mild depression	Severe Depression
Married	431(42.4)	108 (10.6)	95 (9.4)
Married but widowed	247(24.3)	57(5.6)	72(7.1)
Married but separated	3(0.3)	-	-
Never Married	2(0.2)	1(0.1)	-
Total	683(67.2)	166(16.3)	167(16.4)

Legend: data presented in the table shows frequency (percentage) of the population studied.

Table-V Depression across living arrangement

Living arrangement	Depression		
	Normal	Mild depression	Severe Depression
Living with spouse	63(6.2)	16(1.6)	13(1.3)
Living with spouse and children	380(37.4)	92(9.1)	83(8.2)
Living alone	240(23.6)	58(5.7)	71(7.0)
Total	683(67.2)	166(16.3)	167(16.4)

Legend: data presented in the table shows frequency (percentage) of the population studied.

It is found that depression is more among group of married with spouse living (20%) as compare to the group of married but widowed (12.7%) as shown in (Table IV). Among those

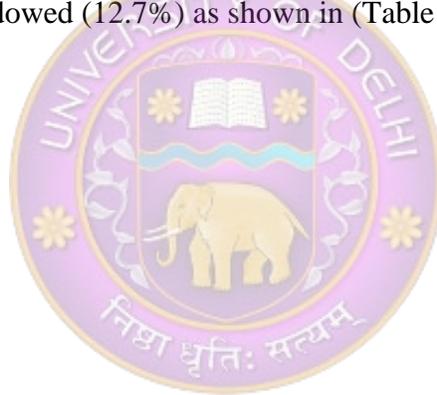
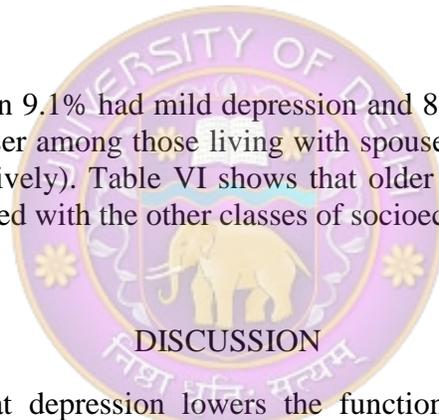


Table-VI Depression across socioeconomic status

Socioeconomic status	Depression		
	Normal	Mild depression	Severe Depression
Lower SEC	386(38)	90(8.9)	97(9.5)
Lower Middle SEC	109(10.7)	23(2.3)	19(1.9)
Upper middle SEC	137(13.5)	41(4)	30(3)
Upper SEC	51(5)	12(1.2)	21(2.1)
Total	683(67.2)	166(16.3)	167(16.4)

Legend: data presented in the table shows frequency (percentage) of the population studied.

living with spouse and children 9.1% had mild depression and 8.2% had severe depression. It is found that depression was lesser among those living with spouse only (i.e. 1.6% and 1.3% mild and severe depression respectively). Table VI shows that older people of lower section shown more depression when compared with the other classes of socioeconomic status.



The present study shows that depression lowers the functional status in older people. A significant correlation is found between self reported depression and functional status when this is measured by ADL (correlation coefficient r , -0.14; p , <0.001) but not by IADL (r , -0.2; p , 0.4) However on studying the correlation with objectively assessed GDS, we found that individuals with higher GDS scores showed significant negative correlation with functional status as measured by ADL (correlation coefficient r , -0.15; p , <0.001); IADL (correlation coefficient r , -0.13; p , <0.001, similar findings have been reported by other researchers.^(19, 70) A strong association between functional dependence, impaired cognition and prevalence of depression has been noted in similar population by Ganguli et al (1999).³⁶ An older age, female sex, a lower socio-economic class, dependent functional status, the prolonged co-morbidities, loneliness feeling and being married or divorced were found to be significant predictors for functional dependence and prevalence of depression among older people.⁴⁹

Functionality, Depression and Age

The comparison of depression among the older people of different age groups shows that 75-79 age groups³⁶ has significantly high depression when compared with the baseline group i.e. 60-64. ADL and IADL level significantly deteriorates with age^(36, 37) As a result age increase leads to the possibilities of physical dysfunction and lowered self autonomy as well as status of older

people.⁵⁰ Also it is found that people are suffering more with perceived depression rather than actual. A longitudinal study done by -Jeon & Dunkle (2009)⁵¹ showed that changes in positive life events, daily hassles (worries), and environmental mastery were significantly -affect late-life depression.⁵²

Functionality depression and Gender

The results show that there is no significant difference among the older male and female on the variable depression although number of females suffering from depression is higher than males. There are researches which -support the findings of this research and say that the prevalence of depressive is higher in women than in men.^(36-37, 53) It is majorly because of the lower social status of women in the society and is well evident in this study. Tremendous suppression of desires and potentialities and unwanted dependence are responsible for high depression among females in society. However in another study It was found that in women and the young-old (55-64) the associations between physical health and depression were insignificant, however, in men and the old-old (75+) all associations were highly significant⁵²

Functionality, Depression and Living arrangement

In this research it is found that those who are living alone have no social support system and are suffering from depression. According to social disengagement theory older people who are not engaging themselves in social activities are depressed.⁴⁶ Older people who are living alone with their physical limitations and owe the responsibility of rearing themselves with limited resources are suffering more from severe depression as compared to widowers who are living with children.⁽⁴⁶⁻⁴⁸⁾ In studies from China and Japan, emotional support from children was positively associated with parent's self-rated health. Depression was found to be associated with low emotional support from relevant others, reception of instrumental help³⁸ and being a widower who did not share living arrangements with children.⁽⁵³⁻⁵⁵⁾ In the absence of community based formal care system those who have no close family, no children or poor relationships with their children tend to be isolated with few social resources and have high rate of prevalence of depression.⁵⁶

Also it is found that older couple living with children are found in severe depression. It is majorly due to the changes in value system of family and socio-economic pressure in today's contemporary society.⁵⁸ In today's scenario older people are considered as a burden on the family and society as a whole. Nuclear family system, economic constraints, women participation in workforce brought major changes in the family value system and lowered the status of elderly member of the family because of his functional and financial dependence,^(57, 59) Less availability of old age homes as well as stigma associated with older parents going to old age home worsened the condition of elderly couple who are abused by their own close relatives. There is a strong need for community based services and old age homes in the society. The emotional support from family increases the utilization of health practices reduces stress and facilitates access to formal and informal care system.^(60,61) In the absence of formal care system as well as community services for older citizens, cases of elder abuse are rapidly increasing in the society. Therefore, in a highly collectivist society like Singapore⁶² and India values of family unity and interdependence are encouraged, living alone would have a negative effect on psychological and physical health of the elderly.

Functionality, Depression and Socio-economic status

It has been found in many research studies that depression among older adults result into functional impairment, poor quality of life, excessive use of health services, and increase in rate of mortality.⁽⁶³⁻⁶⁷⁾ Also people belong to low socio-economic level are suffering more from depression when compared with people of middle and high socio-economic strata. However low socioeconomic status, loss of spouse, living alone, chronic co-morbidities, cognitive impairment, poor ADL and IADL are the potentially modifiable risk factors for depression in the geriatric population.^(68,69) Some kind of financial security may help geriatric population to maintain a decent life which in turn boosts mental health.

CONCLUSION

This study shows that outcome of depression is determined more by socio-economic and cultural factors as compare to biological or hereditary factor and it could be one of the reasons for its high prevalence of depression in society. Social programs and health care programs usually fails or found to be lesser effective because of huge size of population, unwillingness of the society to change and absence of holistic perspective in therapeutic intervention programs. The root cause of poor mental health lies within the attitude of people towards their older citizens at societal level. The society is developing, per capita income is increasing, people are adopting different strategies to cope up with increasing demands for quality of life but in this process the traditional values are losing their space where people give utmost value to the experience of the most elderly person of the family. Unfortunately it has been replaced by the most ignorant members of the family who don't know what is happening in the world, how to use technology and earn money quickly. Therefore intervention programs need to be run at family level and school level to move forward with traditional values and promote a balanced outlook in the society.

SUGGESSTIONS

- There is a lack of proper screening of Geriatric population to identify people with high risk of depression.
- Some of the predictors of depression are potentially modifiable. Therefore interventions should be designed to target potentially modifiable variables and reduce risk of depression.
- Work should be done in the areas of counseling and support, individual and family therapy for dealing with poor functionality.
- Older people should be encouraged to consult a doctor before making changes in their life style.
- There is a need of a psychologist who specializes in aging issues to help older people in developing individual strategies to combat depression.
- Society should come forward to boost the self esteem of its grey haired citizens and try to make them more socially productive and happy.
- Policy should be formed in a way which reduced the possibilities of depression and address other health related issues of older citizens.

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REFERENCES

1. World Health Organization (1946). *Constitution of the World Health Organization. (Article 80) Geneva.*
2. Berman K, Brodaty H. (2006). Psychosocial effects of age-related macular degeneration. *Int Psychogeriatr.* Sep;18(3):415-28. Epub 2006 Feb 8.
3. Merriam-Webster's Online Dictionary. In: Merriam Webster's; 2008.
4. Alexopoulos, George S. & Kelly, Robert E. (2009). "Research advances in geriatric depression". *World Psychiatry* 8 (3): 140–149.PMC 2755271. PMID 19812743.
5. Steffens, D. C. and Potter, G. G. (2008). "Geriatric depression and cognitive impairment". *Psychological Medicine* 38 (2): 163–175. doi:10.1017/S003329170700102X. PMID 17588275.
6. Mitchell, Alex J. and Subramaniam, Hari (2005). "Prognosis of Depression in Old age compared to Middle age: A systematic Review of Comparative Studies". *Am J Psychiatry* 162 (9): 1588–1601. doi:10.1176/appi.ajp.162.9.1588. PMID 16135616.
7. Yohannes AM and Baldwin RC (2008). "Medical Comorbidities in Late-Life Depression". *Psychiatric Times* 25 (14).
8. Krishnan KR. (2007). "Concept of disease in geriatric psychiatry". *Am J Geriatr Psychiatry* 15 (1): 1–11. doi:10.1097/01.JGP.0000224600.37387.4b. PMID 17095750.
9. Alexopoulos GS. (2005). "Depression in the elderly". *Lancet* 365 (9475): 1961–70. doi:10.1016/S0140-6736(05)66665-2.PMID 15936426.
10. US Department of Health and Human Services. National healthcare disparities report, 2012. AHRQ Publication No. 12-0006. March 2012, Rockville, MD. Available at <http://www.ahrq.gov/research/findings/nhqdr/nhdr11/key.html>.
11. timesofindia.indiatimes.com/india/Life-expectancy-in-India.../29513964...
12. www.thehindu.com › S & T › Health

13. Butler RN, Lewis, M.I.(1977). Aging and health positive psychosocial approaches. Saint Louis: The CV Mosby Company 1977.
14. timesofindia.indiatimes.com/india/Life-expectancy-in-India.../29513964...
15. www.thehindu.com › S & T › Health
16. United Nations. *World population aging report (2013)*.
www.un.org/esa/population/publications/worldageing19502050/
17. World population aging 1950-2050. Department of Economic and Social Welfare, population Division. <http://www.un.org/esa/population/publications/worldageing19502050/>
18. Boundless. “The Social Construction of Aging.” *Boundless Sociology*. Boundless, 21 Jul. 2015. Retrieved 22 Jul. 2015 from <https://www.boundless.com/sociology/textbooks/boundless-sociology-textbook/aging-18/a-global-perspective-on-aging-127/the-social-construction-of-aging-718-7746/>
19. Morala DT, Shiomi T, Maruyama H. Factors associated with the functional status of community-dwelling elderly. *J Geriatr Phys Ther* 2006;29(3):101-6.
20. <http://www.valleybehavioral.com/depression/seniors/signs-symptoms-causes#Statistics>
21. Han B. Depressive symptoms and self-rated health in community-dwelling older adults: a longitudinal study. *J Am Geriatr Soc.* 2002;50:1549-1556.
22. Blazer D, Burchett B, Service C, George L. The association of age and depression among the elderly: an epidemiologic exploration. *J Gerontol Med Sci.*1991;46:M210-M215.
23. Blazer D, Hughes D, George L. The epidemiology of depression in an elderly community population. *Gerontologist*. 1987;27:281-287.
24. Berkman L, Berkman C, Kasl S, et al. Depressive symptoms in relation to physical health and functioning in the elderly. *Am J Epidemiol.* 1986;124:372-388.
25. Doraiswamy P, Khan Z, Donahue R, Richard NE. The spectrum of quality-of-life impairments in recurrent geriatric depression. *J Gerontol Med Sci.*2002;57A:M134-M137.
26. Blazer D. *Depression in Late Life*. New York: Springer; 2002.
27. Schneider L, Reynolds C, Lebowitz B, Friedhoff A. *Diagnosis and Treatment of Depression in Late Life*. Washington, DC: American Psychiatric Press; 1994.
28. Blazer D. Psychiatry and the oldest old. *Am J Psychiatr.* 2000;157:1915-1924.
29. Sullivan M, LaCroix A, Baum C. Functional status in coronary artery disease: a one year prospective study of the role of anxiety and depression. *Am J Med.*1997;103:348-356.

30. Blazer D, Moody-Ayers S, Craft-Morgan J, Burchett B. Depression in diabetes and Obesity: racial/ethnic/gender issues in older adults. *J Psychosom Res.* 2002;52:1-4.
31. Magaziner J, Simonsick E, Kashner M. Predictors of functional recovery in the years following hospital discharge for hip fracture. *J Gerontol Med Sci.* 1990;45:M110-M107.
32. Robinson R, Price T. Post-stroke depressive disorders: a follow-up study of 103 patients. *Stroke.* 1982;13:635-641.
33. quickfacts.census.gov/qfd/states/40000.html
34. Cliquet, R., and M. Nizamuddin, eds. (1999). *Population Ageing: Challenges for Policies and Programmes in Developed and Developing Countries*. New York: United Nations Population Fund; and Brussels: Centrum voor Bevolkings-en Gezinsstudiën (CBGS).
35. Black S, Goodwin J, Markides K. The association between chronic diseases and depressive symptomology in older Mexican Americans. *J Gerontol Med Sci.* 1998;53A:M118-M194.
36. 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.
37. White L, Blazer D, Fillenbaum G. Related health problems. In: Cornoni-Huntley J, Blazer D, Lafferty M, Everett D, Brock D, Farmer M, eds. *Established Populations for Epidemiologic Studies of the Elderly*. Bethesda, MD: National Institute on Aging; 1990:70–85.
38. Bosworth H, McQuoid D, George L, Steffens D. Time-to-remission from geriatric depression. *Am J Geriatr Psychiatry.* 2002;10:551-559.
39. Alexopoulos G, Meyers B, Young R, Mattis S, Kakuma T. The course of geriatric depression with “reversible dementia”: a controlled study. *Am J Psychiatr.* 1993;150:1693-1699.
40. Li Y, Meyer J, Thornby J. Longitudinal follow-up of depressive symptoms among normal versus cognitively impaired elderly. *Intl J Geriatr Psychiatry.* 2001;16:718-727.
41. Lyketsos C, Baker L, Warren A, Steele C, Brandt J, Steinberg M. Major and minor depression in Alzheimer's disease: prevalence and impact. *J Neuropsychiatr Clin Neurosci.* 1997;9:556-561.
42. Lyketsos C, Steele C, Galik E, et al. Physical aggression in dementia patients and its relationship to depression. *Am J Psychiatr.* 1999;156:66-71.
43. Gonzales-Salvador T, Aragano C, Lyketsos C, Barba A. The stress and psychological morbidity of the Alzheimer patient caregiver. *Intl J Geriatr Psychiatry.* 1999;14:701-710.

44. Kraaij V, Arensman E, Spinhoven P. Negative life events and depression in elderly persons: a meta-analysis. *J Gerontol Psychol Soc Sci.*2002;57B:P87-P94.
45. Baltes P, Baltes M. *Successful Aging: Perspectives from the Behavioral Sciences*. Cambridge: Cambridge University Press; 1990.
46. Cumming E, Henry W. *Growing Old: The Process of Disengagement*. New York: Basic Books; 1961.
47. Fonda S, Wallace R, Herzog A. Changes in driving patterns and worsening depressive symptoms among older adults. *J Gerontol Psychol Soc Sci.*2001;56B:S343-S351.
48. Braam A, van den Eeden P, Prince M, et al. Religion as a cross-cultural determinant of depression in elderly Europeans: results from the EURODEP collaboration. *Psychol Med.* 2001;31:803-814.
49. Ahmed D, El Shair IH, Taher E, Zyada F. Prevalence and predictors of depression and anxiety among the elderly population living in geriatric homes in Cairo, Egypt. *J Egypt Public Health Assoc.* 2014 Dec; 89(3):127-35. doi: 10.1097/01.EPX.0000455729.66131.49.
50. Mirowsky J¹, Ross CE. Age and depression. *J Health Soc Behav.* 1992 Sep;33(3):187-205;
51. Jeon HS, Dunkle RE. Stress and Depression Among the Oldest-Old: A Longitudinal Analysis. *Res Aging.* 2009;31(6):661-687.
52. Beekman AT, Kriegsman DM, Deeg DJ, van Tilburg W. The association of physical health and depressive symptoms in the older population: age and sex differences. *Soc Psychiatry Psychiatr Epidemiol.* 1995 Jan; 30(1):32-8.
53. Zunzunegui MV¹, Béland F, Llácer A, León V. Gender differences in depressive symptoms among Spanish elderly. *Soc Psychiatry Psychiatr Epidemiol.* 1998 May;33(5):195-205.
54. Sugisawa H, Liang J, Liu X. Social networks, social support, and mortality among older people in Japan. *J Gerontol* 1994;49:S3-S13.
55. Liu X, Liang J, Gu S. Flows of social support and health status among older people in China. *Soc Sci Med* 1995;41:1175-84.
56. Ribera Casado JM, Cruz-Jentoft AJ, Bravo-Fernandez G, Guillen Llera F. Health care for older persons: a country profile. *J Am Geriatr Soc* 2000;48:67-69.
57. Irudaya Rajan S, Mishra US and Sharma, PS. (1995). Living Arrangements among the Indian Elderly, *Hongkong Journal of Gerontology*, Vol. 9, No. 2, pp. 20-28.

58. Irudaya Rajan, S. and Kumar, S (2003). Living Arrangements among Indian Elderly: Evidence from National Family Health Survey. *Economic and Political Weekly*, 38(1),75-80.
59. Irudaya Rajan, S., Mishra, US and Sharma, PS. (1999). *India's Elderly: Burden or Challenge?* New Delhi: Sage Publications and London: Thousand Oaks.
60. Silverstein M, Bengston VL. Do close parent-child relations reduce mortality risk of older parents? *J Health Soc Behav* 1991;32:382-95.
61. Umberson D. Family status and health behavior: social controls as a dimension of social integration. *J Health Soc Behav* 1987;28:306-19.
62. Lau, S. "Collectivism's individualism: value preference, personal control, and the desire for freedom among Chinese in Mainland China, Hong Kong, and Singapore," *Personality and Individual Differences*, vol. 13, no. 3, pp. 361-366, 1992.
63. Cole MG, Dendukuri N. Risk factors for depression among elderly community subjects: A systematic review and meta-analysis. *Am J Psychiatry*. 2003;160:1147-56.
64. Chan A, Malhotra C, Malhotra R, Ostbye T: Living arrangements, social networks and depressive symptoms among older men and women in Singapore. *Int J Geriatr Psychiatry* 2011, 26:630-639.
65. Clausen T, Wilson A, Molebatsi R, Holmbow-Ottensen G: Diminished mental- and physical function and lack of social support are associated with shorter survival in community dwelling older persons of Botswana. *BMC Publ Health* 2007, 7:144.
66. Sicotte M, Alvarado BE, León E-M, Zunzunegui M-V: Social networks and depressive symptoms among elderly women and men in Havana, Cuba. *Aging Ment Health* 2008, 12:193-201.
67. Silverstein M, Cong Z, Li S: Intergenerational transfers and living arrangements of older people in rural China: Consequences for psychological well-being. *J Gerontol* 2006, 61B:S256-S266.
68. Blazer DG: Depression in Late Life: Review and Commentary. *J Gerontology: Med Sci* 2003, 58:249-265.
69. Barua, A., Ghosh, M. K., Kar, N. and Basilio, M. A.(2010). Socio-demographic Factors of Geriatric Depression. *Indian J Psychol Med*. 2010 Jul-Dec; 32(2): 87-92. doi: 10.4103/0253-7176.78503

Stuck AE, Walthert JM, Nikolaus T, Bula CJ, Hohmann C, Beck JC. Risk factors for functional status decline in community-living elderly people: a systematic literature review. *Soc Sci Med* 1999;48(4):445-69.

