



Journal Homepage: - www.journalijar.com
**INTERNATIONAL JOURNAL OF
 ADVANCED RESEARCH (IJAR)**

Article DOI: 10.21474/IJAR01/7024
 DOI URL: <http://dx.doi.org/10.21474/IJAR01/7024>



RESEARCH ARTICLE

PREVALENCE OF GERIATRIC DEPRESSION IN SOUTH INDIA – A REVIEW.

Hetzy SK¹ and Juliet S².

1. Associate Professor, ESIC College of Nursing, Gulbarga, Karnataka-585106.
2. Professor cum Vice-principal, Sacred Heart Nursing College, Madurai, Tamilnadu-625020.

Manuscript Info

Manuscript History

Received: 04 March 2018
 Final Accepted: 06 April 2018
 Published: May 2018

Keywords:-

Depression, Elderly, South India.

Abstract

A review of the existing literature on prevalence of depression among elderly arising from India was carried out. Search engines such as PubMed, Google Scholar, and Google were utilized to identify the relevant studies conducted in southern Indian states of Tamil Nadu, Kerala, Andhra Pradesh, Telangana, Karnataka, Goa and Maharashtra, and the union territories such as Andaman and Nicobar Islands and Puducherry. Most of the literatures that are available are in terms of prevalence of depression than interventional studies. Community-based studies involving 70 to 1200 elderly subjects report prevalence rate varying from 9.3 % to 76 %. While clinic-based studies involving 54 to 525 participants report prevalence rates ranging from 25% to 72%. These studies have reported depression to be more common among females than males. Other demographic factors that have been associated with depression among elderly include being unmarried, divorced or widowed elderly, residing in rural locality, being illiterate, increasing age, lower socioeconomic status, and unemployment. Depression has also been shown to be associated with various psychosocial factors, lifestyle and dietary factors, and presence of chronic physical illness. The review of data suggests that prevalence of depression among elderly in South India is high. There is an urgent need to conduct large multicenter studies to fill this void in research.

Copy Right, IJAR, 2018.. All rights reserved.

Introduction:-

The rise in the proportion of the ageing population denotes one of the most noteworthy demographic shifts in history. The world's population is getting aged rapidly and elderly persons, those who aged 60 or above is estimated to double from about 12% (900 million) to 22% (2 billion people) from 2015 to 2050 (1). In India the population of elders is increasing alarmingly, they constitute about 8% of the total population and estimated to increase to 12.2% by 2026 (2,3). Social and cultural shift had also impinged the rural India, which for centuries boasted of joint family system with high respect for its elderly members, now moving towards more nuclear families discounting the elderly. Ageing is a universal process that is associated with weakening health status. Today, depression is one of the most common cause of disability in the elderly. The various consequences due to depression are reduced life satisfaction and quality, social deprivation, loneliness, cognitive decline, impairments in activities of daily living and suicide.

Corresponding Author:- Hetzy SK.

Address:- Associate Professor, ESIC College of Nursing, Gulbarga, Karnataka-585106.

Even though depression is the most common psychiatric disorder in the elderly, it is commonly misdiagnosed and under treated. This could be due to the misunderstanding that depression is part of aging rather than a remediable condition. There is a need to highlight the medical and social problems that are being faced by the elderly population. Approaches for bringing about rehabilitation and improvement in their quality of life are also the need of the hour.

This study aims to analyze the studies on prevalence and factors associated with geriatric depression conducted in south Indian community. This review would throw some light on the prevalence, magnitude and factors associated with geriatric depression in South India. Although India is the second-most populous country in the world in terms of elderly population, there has been meager research on geriatric depression in India, and none of the review articles has attempted to compile the available literature especially conducted in south Indian community. In this background, this review article attempts to look at the available literature arising from South India with respect to depression in elderly. For this, various search engines such as PubMed, Google Scholar, Google, and Medknow were utilized with keywords elderly, geriatric, South India, depression, prevalence and socio-economic factors, epidemiology and magnitude. The reference lists of the available articles were further evaluated to locate other possible articles. Data presented in this review provide a comprehensive review of available literature.

Epidemiology Of Depression Among Elderly In India:-

Compared to other aspects of depression in elderly, a significant amount of literature is available on the prevalence of depression among elderly and many studies have been conducted in the last decade. As shown in Table 1, we could locate 44 studies (4-47) which have evaluated the prevalence of depression among elderly. Out of 44 studies found in literature search on prevalence of geriatric depression in South India, there are 8 studies conducted in Tamil Nadu, 4 studies in Kerala, 12 studies in Karnataka, 8 studies in Andhra Pradesh/Telangana and 11 studies in Maharashtra and 1 study conducted in Puducherry [Table 2].

These studies have been done in various set-ups such as community (4-37), inpatients in a hospital outpatient of medical clinics (38-43), psychiatric clinics (44) etc. Occasional studies have also looked at the prevalence of depression in special populations like elderly living in old age homes (45-47). However, most of these studies are community-based. The sample has largely been recruited from preassigned rural areas and urban slums. Few authors have recruited the entire population living in a village by house to house surveys, while others have selected the study population using various randomization techniques to recruit the sample. The most common instrument that has been used to evaluate depression has been Geriatric Depression Rating Scale (GDS), used in 31 of the 44 studies. Other instruments that have been used to diagnose depression include WHO International classification of diseases tenth revision (ICD10) criteria, Beck Depression Inventory (BDI), Montgomery Asberg Depression Rating Scale (MADRS), Patient health questionnaire-9 (PHQ-9), Zung depression scale, Hamilton Depression Rating Scale (HDRS), G.I Brink Depression Scale Mood Assessment scale-30 and GHQ-12, etc.

In most of the studies, the age cut-off which has been used to identify elderly patients is 60 or above. The sample size in community-based studies has ranged from as low as 70 to as high as 1200 and prevalence of depression has ranged from 9.3 % to 76 %. Clinic-based studies involving 54 to 525 participants report prevalence rates ranging from 25% to 72%. The sample has varied from patients attending psychiatry units to multidisciplinary wards. Studies that have compared patients with specific medical illnesses with those without illnesses, in general, suggest that elderly patients with medical illnesses such as diabetes mellitus have a higher prevalence (42.4% versus 18%) of depression (39).

Correlates/Factors Associated With Depression In Elderly:-

Studies have consistently shown depression to be higher in elderly females [Table 3]. Other demographic factors that have been linked with depression among elderly include being unmarried, divorced or widowed elderly, residing in rural locality, being illiterate, increasing age, lower socioeconomic status, and being unemployed [Table 3]. The various psychosocial factors which have been shown to be associated with depression in elderly include loneliness, poor social/family support, isolation, dependency, lack of family care, and affection, insufficient time spent with children, stressful life events, perceived poor health, lower level of spirituality, and higher use of emotion-based coping. [Table 4]. The lifestyle and dietary factors that have been linked with depression include lack of hobby, irregular dietary habits, substance use/smoking, and lack of exercise [Table 5]. In general, data also suggest that presence of chronic physical illnesses increases the risk of depression. Diabetes Mellitus, Hypertension/ cardiac illness, Transient ischemic attack/stroke, Past head injury and Visual impairment [Table 6].

Discussion:-

As shown in Table 1, we could locate all 44 studies which have evaluated the prevalence of depression among elderly. These studies have been done in various set-ups such as community, inpatients in a hospital and outpatient of medical clinics, and psychiatric clinics, etc. Occasional studies have also looked at the prevalence of depression in special populations like elderly living in old age homes. However, most of these studies are community-based. The sample has largely been recruited from preassigned rural areas and urban slums. Few authors have recruited the entire population living in a village by house to house surveys, while others have selected the study population using various randomization techniques to recruit the sample. The most common instrument that has been used to evaluate depression has been Geriatric Depression Rating Scale (GDS), used in many studies. Other instruments that have been used to diagnose depression include international classification of diseases (ICD- 10) etc.

In most of the studies, the age cut-off which has been used to identify elderly patients is 60 or above. The sample size in community-based studies has ranged from as low as 70 to as high as 1200 and prevalence of depression has ranged from 9.3 % to 76 %.

Available literature arising from India suggests that the prevalence rate of depression is significantly high among elderly population. At present, major proportion of the elderly population in India resides in rural localities, which have poor access to mental health services, as psychiatric services are more or less concentrated in the urban areas. Accordingly, most of the care to the elderly is provided by the primary care physicians. Keeping this in mind, it is important to train the primary care physicians to diagnose and manage depression among elderly. Further, keeping in mind the fact that depression is more common among those suffering from various physical illnesses, there is a need to train specialists from different disciplines to identify and manage depression.

Data from South India suggest that various psychosocial factors such as loneliness, poor social/family support, isolation, dependency, lack of family care and affection, insufficient time spent with children, stressful life events, perceived poor health, lower level of spirituality, and higher use of emotion-based coping increase the risk of depression among the elderly. Traditional joint family structure in India is on a downhill, and it is being replaced by nuclear families. If one takes this into account along with the psychosocial factors associated with depression among elderly, it can be said that over the years there would be a significant rise in depression among the elderly. Hence, before such a scenario arises, there is a need to emphasize the importance of joint family structure and encourage people to follow the same.

The lifestyle and dietary factors linked with depression suggest that there is a need to encourage geriatric patients to indulge in regular exercise, abstain from various substances including smoking, maintain regular dietary habits and develop hobbies to keep themselves occupied.

Studies from South India suggests that in medically ill geriatric patient's depression is associated with higher level of disability, dysfunction, poor quality of life, and poor outcome. Accordingly, all elderly patients suffering from various physical illnesses must be screened for depression, and it must be treated adequately.

At present, it can be said that research on elderly depression from India is meager. Although many studies have evaluated the prevalence of depression in elderly, the majority of them have relied just on the use of various rating scales by non-psychiatrists. Only a few studies have relied on diagnostic instruments to confirm the diagnosis of depression. All the available studies are single center studies. Hence, there is a need for a multicentric study relying on two-stage evaluation (screening followed by confirmation of diagnosis by a psychiatrist) to study the prevalence of depression among elderly. Till date, none of the studies has specifically focused on the incidence of depression among elderly. There is a need to follow-up a cohort of elderly patients to study the incidence rates.

There is lack of data on the symptom profile, etiology, suicidal behavior, neurobiology, management, course and outcome, association of depression with other psychiatric disorders such as dementia and delirium, and bidirectional relationship of depression with various physical illnesses. Similarly, there are no data on resilience. Many cultural factors, such as religion and spirituality, can play an important role in the prevention of depression and also have important implications in the management of depression. These have also not been evaluated thoroughly. Researchers working in the area of Geriatric Psychiatry must take-up studies to fill this void.

Conclusion:-

To conclude, this review suggests that depression is quite common among elderly living in the community in South India. Prevalence of depression is also quite common among elderly patients attending different medical set-ups. These high prevalence rates suggest that there is a need to sensitize the primary care physicians and specialists from different specialties to identify and manage depression. There is a significant gap in research evaluating various aspects of depression in elderly in India. Accordingly, there is an urgent need to focus on depression among elderly. There is a need for multicentric, longitudinal studies evaluating various aspects of depression.

References:-

1. WHO. Mental health and older adults. World Health Organization, Geneva; 2016. Available at <http://www.who.int/mediacentre/factsheets/fs381/en/>. Accessed on 3 February 2016.
2. Census of India. Population composition. Ministry of Home Affairs, Government of India. New Delhi, India; 2011.
3. Ministry of statistics and programme. Situation analysis of the elderly in India. Central statistics office ministry of statistics and programme implementation. Government of India. Available at http://mospi.nic.in/mospi_new/upload/elderly_in_india.pdf. Accessed on 3 February 2016.
4. Mohan Y, Jain T, Krishna S, Rajkumar A, Bonigi S. Elderly depression: unnoticed public health problem in India- a study on prevalence of depression and its associated factors among people above 60 years in a semi urban area in Chennai. *Int J Community Med Public Health* 2017; 4:3468-72.
5. Srivastav M, Bavaskar Y, Choudhary R, Agrawal S. Prevalence and determinants of depression in geriatric women in an urban slum area of Mumbai suburbs. *Int J Community Med Public Health* 2017; 4:3135-9.
6. Thilak SA, Sarada AK, Nelloopant SA. Prevalence and factors associated with depression among the elderly in rural areas of Kannur, North Kerala, India-a cross sectional study. *Int J Community Med Public Health* 2016; 3:1986-91.
7. Suganathan S. A study on depression among elderly in a rural population of Tamil Nadu, India. *Int J Community Med Public Health* 2016; 3:2571-4.
8. Patil KS et al Depression among elderly people in an urban slum of Central India *Panacea Journal of Medical Sciences*, September-December,2016;6(3): 128-133
9. Chauhan P, Kokiwar PR, Shridevi K, Katkuri S. A study on prevalence and correlates of depression among elderly population of rural South India. *Int J Community Med Public Health*. 2016; 3:236-9.
10. D'souza L, Ranganath TS, Thangaraj S. Prevalence of depression among elderly in an urban slum of Bangalore, a cross sectional study. *Int J Interdiscip Multidiscip Stud* 2015; 2:1-4.
11. Nakulan A, Sumesh TP, Kumar S, Rejani PP, Shaji KS. Prevalence and risk factors for depression among community resident older people in Kerala. *Indian J Psychiatry* 2015; 57:262-6.
12. Naik PR, Nirgude AS. Depression among the Elderly: A Cross Sectional Study in a Rural Community of South India. *Ntl J of Community Med* 2015; 6(3):394-397.
13. Sabitha RJ, Lucy R, Thomas B. Prevalence of depression and its risk factors among a rural geriatric population of North Kerala. *Public health Rev: Int J Public health Res* 2015;2(4): 80-86.doi:10.17511/ijphr. 2015.i4.09.
14. Dumbrey SS, Kale S, Jadhav A, Neetu PV. A descriptive study to assess prevalence of depression among geriatric group. *Asian J Multidiscip Stud* 2014; 2:72-82.
15. Rajendra K, Ramegowda. A sociological study on the prevalence of depression among elderly. *IOSR J Humanit Soc Sci* 2014; 19:24-6.
16. Kirubakaran C, Kokilavani N. A study to assess the effectiveness of cognitive behavioral therapy in reducing the level of depression among geriatric people in Vellore district. *Int J Recent Sci Res* 2014; 5:1633-5.
17. Sanjay TV, Jahnvi R, Gangaboraiah B, Lakshmi P, Jayanthi S. Prevalence and factors influencing depression among elderly living in the urban poor locality of Bengaluru city. *Int J Health Allied Sci* 2014; 3:105-9
18. Udayar SE, Devika PJ, Konduru RK et. al. A study of economic dependency and its relation to depression among elderly people in rural area of Chittoor district, Andhra Pradesh. *Int J Health Sci Res*. 2014;4(12):100-105.
19. Santosh A et.al. Magnitude of Depression among Geriatric Population and Factors Associated With it in the Urban Slum, Bashanagar, Field Practice Area of SSIMS and RC Davangere" - A Cross Sectional Study. *Int J Med Pharm Sci*. March 2014; 4 (7): 20-26
20. Bodhare TN, Kaushal V, Venkatesh K, Anil Kumar M. Prevalence and risk factors of depression among elderly population in a rural area. *Perspect Med Res* 2013; 1:11-5.

21. 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.
22. Sinha SP, Shrivastava SR, Ramasamy J. Depression in an older adult rural population in India. *MEDICC Rev* 2013; 15:41-4.
23. Swarnalatha N. Prevalence of depression among the rural elderly in Chittoor district, Andhra Pradesh. *J Clin Diagn Res* 2013; 7:1356-60
24. Radhakrishnan S, Nayeem A. Prevalence of depression among geriatric population in a rural area in Tamilnadu. *Int J Nutr Pharmacol Neurol Dis* 2013; 3:309-12.
25. Abhishekh HA, Raghuram K, Shivakumar S, Balaji AL. Prevalence of depression in community dwelling elderly: Study from rural population of India. *J Neurosci Rural Pract* 2013;4 (Suppl 1): S138
26. Sundru MB, Goru KB. Epidemiological study of depression among population above 60 years in Visakhapatnam, India. *Int J Med Sci Public Health* 2013; 2:695-702.
27. Nair SS, Hiremath S. Depression among geriatrics: Prevalence and associated factors. *Int J Curr Res Rev* 2013; 5:110-2
28. Swapnil P. Yadav, Mohan K. Doibale, N.R. Aswar, I.F. Inamdar, V.K. Sonkar, R.D. Gadekar. "Assessment of Socio-demographic correlates of depression among the elderly in an urban area in Maharashtra". *Journal of Evolution of Medical and Dental Sciences* 2013; Vol. 2, Issue 51, December 23; Page: 9895-9900.
29. Singh AP, Kumar KL, Reddy CP. Psychiatric morbidity in geriatric population in old age homes and community: A comparative study. *Indian J Psychol Med* 2012; 34:39-43
30. Kamble SV, Ghodke YD, Dhumale GB, Goyal RC, Avchat SS. Health status of elderly persons in rural area of India. *Ind Med Gaz* 2012; 295-9.
31. Dighe SV, Gawade EM. Depression among rural elderly population. *Sinhgad E J Nurs* 2012; 2:18-22.
32. Reddy NB, Pallavi M, Reddy NN, Reddy CS, Singh RK, Pirabu RA. Psychological morbidity status among the rural geriatric population of Tamil Nadu, India: A cross-sectional study. *Indian J Psychol Med* 2012; 34:227-31.
33. Bharatwaj K, Rajaram VP. Psychiatry of old age in India. *Int Rev Psychiatry* 2011; 5:165-70.
34. Sandhya GI, Geriatric depression and related factors - a cross sectional study from a rural community in South Kerala. *J Ind Acad Geriatrics* 2010; 6:61-63.
35. Barua A, Kar N. Screening for depression in elderly Indian population. *Indian J Psychiatry* 2010; 52:150-3.
36. Rajkumar AP, Thangadurai P, Senthilkumar P, Gayathri K, Prince M, Jacob KS. Nature, prevalence and factors associated with depression among the elderly in a rural south Indian community. *Int Psychogeriatr* 2009; 21:372-8.
37. Jain RK, Aras RY. Depression in Geriatric Population in Urban Slums of Mumbai. *Indian Journal of Public Health* 2007; 51(2):112-113.
38. Singh D, Kedare J. A study of depression in medically ill elderly patients with respect to coping strategies and spirituality as a way of coping. *J Geriatr Ment Health* 2014; 1:83-9.
39. Kaulgud RS, Nekar MS, Sumanth KJ, Joshi RR, Vijayalakshmi PB, Desai S, et al. Study of depression in patients with diabetes compared to non-diabetics among elderly population and its association with blood sugar, HbA1c values. *IJBAR* 2013; 4:55-61.
40. Rajashekar P, Pai K, Thunga R, Unnikrishnan B. Post-stroke depression and lesion location: A hospital based cross-sectional study. *Indian J Psychiatry* 2013; 55:343-8.
41. Naveen Kumar D, Sudhakar TP. Prevalence of cognitive impairment and depression among elderly patients attending the medicine outpatient of a tertiary care hospital in south India. *Int J Res Med Sci* 2013; 1:359-64.
42. Vaishali K, Kumar SP, Kumar V, Adhikari P. Relationship of age, gender and routine physiotherapy with depression among elderly people in a multidisciplinary in-patient geriatric care ward: A cross-sectional study. *Physiother Occup Ther J* 2012; 5: 122-6. 50.
43. Kumar KL, Kar S, Reddy PK. Psychiatric comorbidity in geriatric inpatients. *J Dr NTR Univ Health Sci* 2012; 1:81-5.
44. Chhabra V, Kar N. Geriatric patients in a psychiatric ward: A 10-year profile. *Indian J Psychiatry* 2002; 44 Suppl: 47.
45. Ulahannan A, Xaviour S. The Effect of Laughter Therapy on Depression in Elderly Residents of Selected Old Age Home from Maharashtra. *Sinhgad e-journal of nursing* 2017;7: 1:15-19
46. Goud AA, Nikhade NS. Prevalence of depression in older adults living in old age home. *IAIM*, 2015; 2(11): 1-5.
47. Amonkar PS, Mankar MJ. Geriatric. Depression and Associated Risk Factors: A Cross sectional. Study in an Urban Setting. *MGM J Med Sci* 2015;2(4):179-183.

S.NO	Author	Place	Age cut-off years	Sample Size	Methodology & Sampling Technique	Scale	Prevalence depression
Community Based Study							
1.	Mohan Y. 2017 (4)	Thirumazhisai, Chennai Tamil Nadu	60	100 Elderly Community Based	Cross sectional study, Multistage random sampling	GDS	76%
2.	Shrivatsav M. 2017 (5)	Urban area Mumbai. Maharastra	60	336 Women Elderly	Cross Sectional study Systemic Random Sampling	Mood Assessment scale-30	Toal:50.89% Mild:26.19% Major:24.70 %
3.	Thilak SA et al. 2016 (6)	Kannur, Kerala	60	250 community based	Cross sectional study Convenient sampling technique	GDS-15	72.4%
4.	Suganathan S. 2016 (7)	Poonamalle, Porur, Thiruvallur district, Chennai Tamil Nadu	60	450 Elderly Community Based	Cross sectional Descriptive study. Cluster sampling method	GDS	Male- 56.8 Female - 79.2%
5.	Patil KS. 2016 (8)	Urban, Jaitala Nagpur Maharastra	60	100 Elderly Community Based	Simple random sampling (Lottery Method)	GDS-Short form	39.5%
6.	Chauhan P.2016 (9)	Venkatachalam Village, Nellore, Andrapradesh	60	290 Elderly Community Based (Rural)	Cross sectional Descriptive study Universal Sampling Technique	GDS-15	9.3%
7.	D'Souza et al. 2015 (10)	Urban slum; Bengaluru Karnataka	60	210 community-based	Cross sectional study	GDS-15	51.9%
8.	Nakulan A et al. 2015 (11)	Thrissur District Kerala	60	220 Elderly Community Based	Cross sectional survey. Case control study design used to select risk.	ICD-10 Montogomery Asberg Depression Scale	39%
9.	Naik PR et al. 2015 (12)	Mangalore Karnataka	60	230 elderly, Rural Community based	Cross sectional survey.	GDS	Total :59.6% Mild - 79.5% Severe - 20.4%

10	Sabitha R J et al. 2015 (13)	Kozhikode district Kerala	60	395 Elderly Community based study	Cross sectional. Cluster sampling technique	GDS-15	Total -58.2% Mild-28.9% Moderate-22.6% Severe-6.6%
11	Dumbray et al. 2014 (14)	Urban slums-Pune Maharashtra	60	100 community-based	Nonprobability convenient sampling	GDS	30%
12	Rajendra and Ramegowda 2014 (15)	Kundapur, Karnataka	60	100 community-based	Cross sectional: Survey Simple Random Sampling Technique	GDS	31.2%
13	Kirubakaran and Kokilavani 2014 (16)	Vellore, Tamil Nadu	60	300 community-based	Pre-Experimental Evaluative research approach, Simple Random sampling technique.	G.L Brink depression scale	12.7%
14	Sanjay et al. 2014 (17)	Urban poor locality, Bengaluru Karnataka	60	100 community-based:	Cross sectional Descriptive study: House to house survey Random Sampling Technique	GDS-15 (Kannada)	36%
15	Udayar SE 2014 (18)	Chithoor District Andrapradesh	60	418 Community based	Cross sectional study- random sampling	GDS	44.1%
16	Santosh et al. 2014 (19)	Davangere Karnataka	60	150 Urban community based	Cross sectional study	GDS	33%
17	Bodhare et al. 2013 (20)	Vutoor (rural area), Andhra Pradesh	60	190 community-based	Cross sectional study	PHQ-9	Total: 44.7 Minor: 28.9 Major : 15.8
18	Arumugam et al. 2013 (21)	Adayalampattu (Urban slum) and Parivakkam (rural area); Chennai Tamilnadu	60	173 community-based:	Cross sectional survey study, House to house survey	GDS	Urban: 41 % Rural: 46%
19	Sinha et al. 2013 (22)	Sembakkam (rural area) Tamil Nadu	60	103 community-based:	Cross sectional Descriptive study, House to house	GDS-15	Total: 57.3% Mild: 22.3 % Moderate:13.6 %

					survey, Universal Sampling Technique		Severe: 6.8%
20	Swarnalatha 2013 (23)	Chandragiri (rural area); Tirupathi Andhra Pradesh	60	400 community- based: 212 Rural health centre	Cross sectional :Observational Descriptive study, House to house survey Random Sampling Technique	GDS-15	47%
21	Radhakrishna and Nayeem 2013 (24)	Attyampatti (rural area), Tamil Nadu	60	400 community- based:	Cross sectional: Survey House to house survey, Simple Random Sampling Technique	GDS	Mild: 38 % Severe: 21%
22	Abhishek et al. 2013 (25)	Haloor, Karnataka	65	70 community- based	Survey approach	Hamilton depression rating scale (HDRS)	14.3%
23	Sundru and Goru 2013 (26)	Vishakhapatna m, Andhra pradesh	60	1200 community- based,	Cross sectional: House to house survey Simple Random Sampling Technique	GDS-30	31.7%
24	Sreejith S. Nair et al 2013 (27)	Ashapur, Raichur Karnataka	60	182 Urban slums Community based	Cross sectional Epidemiologic al survey. Simple Random sampling method	GDS	32.4%
25	Swapnil P 2013 (28)	Urban - Ambedkar Nagar and NayiAbadi of Nanded City Maharastra	60	270 Community Based	Cross sectional, Systemic Random sampling	GDS-15	12.94%
26	Singh et al. 2012 (29)	Khammam district, Andhra Pradesh	60	63-Community 64-old age homes	Cross sectional study	ICD-10	21.7%
27	Kamble et al. 2012 (30)	Ahmednagar, Maharashtra	60	494 — community	Cross sectional	GHQ-12	31.4%

				based:	study- Simple and Systematic Sampling Technique		
28	Dighe and Gwadhe 2012 (31)	Villages of Rahata district, Maharashtra		70 community- based:	Cross sectional study, Descriptive Survey research design Purposive Sampling Technique.	GDS-30	Total: 62.5 Mild: 51.5 Severe: 11
29	Reddy et al 2012 (32)	Valadi,Trichy Tamil Nadu	60	800 community- based	Cross sectional study Random Sampling Technique	GDS-15	47%
30	Bharatwaj and Rajaram 2011 (33)	Pondicherry Pondicherry (UT)	60	100 community- based		GDS	Total: 98 Minor:78 Major:20
31	Sandhya GI 2010 (34)	Karakonam Kerala	60	256 Community- based study	Cross sectional study: With double stage sampling. Systematic and stratified random sampling	GDS-15	25.4%
32	Barua A, Kar N. 2010 (35)	Udupi, Kundapura, Karkala Karnataka	60	627 community- based	Cross sectional study- Simple Random Sampling Technique without replacement method: Probability Proportionate to size.	WHO (five) well-being index Major (ICD-10) depression inventory	21.7%
33	Rajkumar et al. 2009 (36)	Kaniyambadi Block, Vellore Tamil Nadu	60	1000 community- based	Cross sectional study Case control design framework	ICD-10	12.5%
34	RK Jain & Aras 2007 (37)	Urban slum Mumbai Maharashtra	60	196 community based	Cross sectional epidemiologic al study Random	GDS	Male:42.8% Female:57.8 %

					sampling using random table		
Clinic Based Study							
35	Singh and Kedare 2014 (38)	Nagpur Maharashtra	60	100 medically ill	Cross sectional study	GDS	72%
36	Kaulgud et al. 2013 (39)	Hubli Karnataka	65	300 clinic-based 146-diabetes 154-nondiabetic	Cross sectional study	Zung depression scale	Diabetic: 42.4% Nondiabetic: 18%
37	Rajashekar et al. 2013 (40)	Mangalore Karnataka	50	62 — stroke patients clinic-based (52 were aged ≥ 50 years)	Cross sectional study	BDI & MADRS	45%
38	Naveen Kumar and Sudhakar 2013 (41)	Tirupati Andra-pradesh	60	525 Clinic based	Cross sectional descriptive study Convenient sampling technique	GDS	44.8%
39	Vaishali et al. 2012 (42)	Mangalore, Karnataka	60	54 clinic-based multidisciplinary inpatient wards	cross-sectional study	GDS	55%
40	Kumar et al. 2012 (43)	Khammam, Andhra-pradesh	60	120 clinic-based inpatient	Cross sectional study	ICD-10	25%
41	Chhabra and Kar 2002 (44)	Manipal Karnataka		Psychiatric inpatient			Mood Disorder: 46%
Old Age Homes Study							
42	Ambily Ulahannan 2017 (45)	Mumbai, Maharastra	60 years	60 Elderly Old Age Home	Quantitative Quasi Experimental Non -Random Purposive sampling method	GDS	Mild-40% Moderate - 60%
43	Goud AA et al. 2015 (46)	Ahmed Nagar Maharastra	60-85	80 Elderly Old age home	Cross sectional observational.	GDS scale	53.75%
44	Amonkar PS 2015 (47)	Panvel.Navi Mumbai, Maharastra	60	100 Elderly Old Age Home	Cross sectional study, random sampling	GDS-Short form	31%

Table: 1 Studies evaluating prevalence on depression on elderly

Table 2: Distribution of studies conducted on prevalence of geriatric depression in south Indian states.

S. No	South Indian States	Reference Numbers	Total (n=44)
1	Tamil Nadu	13,17,26,31,32,34,42,46	8
2	Kerala	16,21,23 and 44	4
3	Karnataka	20,22,25,27,29,35,37,45,49,50,52 and 54	12
4	Andrapradesh /Telangana	19,28,30,33,36,39,51 and 53	8
5	Maharashtra	15,18,24,38,40,41,47,48,55,56 and 57	11
6	Puducherry	43	1

Table 3: Demographic Factors associated with geriatric depression.

Demographic variables	Reference Number
Female gender	14,16,17,19,20,21,23,31,33,34,37,38,39,40,41,56& 57
Rural locality	36
Increasing age	14,16,17,19,18,33,34,39,42,51 and 56
Illiteracy	16,17,18,31,33,37,39,40,42,44,47,51 and 57
Lower socioeconomic status/income	20,23,28,33,34,37,37,40,41 and 42
Widowed/single/unmarried/divorced	14,16,19,23,28,29,34,41,42,43,47 and 56
Nuclear family	18,29 and 45
Unemployment	14,15,36,37 and 38

Table 4: Psychosocial factors associated with geriatric depression.

Psychosocial factors	Reference Number
Loneliness	16,18,20,23,33,34,38,42 and 44
Poor social/family support	25 and 44
Dependency	15,28 and 44
Isolation/no social interaction	20
Dependency	24,31,33, 40,45 and 47
Lack of family care and affection/lack of caregivers	25,40 and 44
Insufficient time spent with children	31
Stressful life events	21 and 36
Perceived poor health status	30

Table 5: Lifestyle and dietary factors associated with geriatric depression.

Lifestyle and dietary factors	Reference Number
Lack of hobby	40,44
Irregular dietary habits	33
Substance use/smoking	15,34 and 37
Lower spirituality	48
Emotion-based coping	48

Table 6: Physical illness associated with geriatric depression

Physical illnesses	Reference Number
Physical illness	23,34,41,48 and 57
Diabetes mellitus	38,46 and 49
History of hypertension/ cardiac illness	29,38,45 and 46
Transient ischemic attack/stroke	46
Past head injury	46
Visual impairment	18,38 and 45