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A study on the prevalence of depression and its associated factors among the elderly in Kancheepuram district, South India.

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Abstract

Background: The proportion of the elderly persons is increasing, most of the people lives in rural areas and depression among the elderly impairs the functioning in daily life. As people age, they experience multiple chronic health problems. Health problems when compounded with depression, worsens the clinical outcome still further. **Objectives:**To assess the prevalence of depression and its associated factors among the elderly. **Materials and methods:** This is a part of a larger study, conducted as a community based cross sectional study on nutrition and health status of the elderly.Data was collected on an interview schedule in the local language among 496 the elderly persons (60 years and above) selected by multi stage sampling technique from Kancheepuram District in Tamil Nadu using semi - structured questionnaire. Nutritional assessment done using Mini Nutritional Assessment (MNA) scale, hemoglobin estimation by Cyano-methemoglobin method and depression scaleusing Geriatric Depression Scale – Short Form (15 questions).**Results:**Nearly half (47.8%) of the elderly were depressed. It was found that depression is high in labourers, poorly educated, females, those living alone, without their spouse, financially dependent and lower socio economic status and with co – morbidities, anemia and malnutrition. Multi variateanalysis revealed a significant association of depressionin the elderlywith lower socio economic status (OR = 1.97), those not living with their spouse (OR= 4.5), who were malnourished or at risk of malnutrition (OR = 5.8) and who had co-morbidities including anemia and Malnutrition (OR = 1.79). **Conclusion:** There is an urgent need to address depression among the elderly. Mental health services to the elderly should be incorporated in the screening services rendered in primary health care settings for a proper care and support to improve their quality of life.

Key-words: Anemia, Depression, Elderly,Geriatric Depression Scale, MNA.

Introduction

Mental health is as important as physical health. Mental health issues are on the rise among all ages and across countries. The World Health Day campaign theme for the year 2017 is "**Depression: Let's talk"** as depression is the most common psychiatric condition nowadays. In India, the National Mental Health Survey 2015-16 revealed that around 15% of Indians have one or more mental health issues which needs professional help and one in 20 Indians suffers from depression.(1)

The World Health Organization identified three groups that are disproportionally affected: adolescents and young adults, women of childbearing age (particularly following childbirth) and older adults (over 60s).(1)The WHO's focus is not only on demographic vulnerability, but also on geographic and financial vulnerability.

Depression is a major public health problem which is common among the elderly for the following reasons:

The proportion of the elderly persons who are most vulnerable is increasing worldwide (demographic transition) due to the reduction in fertility rates and mortality rates through increased health care facilities which led to increased life span and also due to literacy, urbanization and industrialization.(2)

India is one among the graying nations as it has 8.14% of its population above 60 years of life and projected to be 19% in 2050(3). In India, about 80% of the elderly lives in rural areas which makes the service delivery difficult. Around 30% of the elderly people are in below poverty line.(3) Thirty percent of men and fifteen percent of women aged 60 years and above are in active labour force because of less awareness to plan for retirement savings and less coverage of public social security schemes.(4)

As people age, they experience several chronic health problems at the same time.Physiological health problems directly affects the mental wellbeing of the elderly and also the elderly have negative perceptions of their health which in turn exerts a negative effect on their quality of life.(5)These challenges also pose a threat to health care systems, care givers and also to country's economic growth.

Furthermore, the elderly ages are compounded with co-morbid conditions, especially the non – communicable diseases that needs long term careand support which increases the proportion of depression in this age group.Common conditions in older age include hypertension, back and neck pain, osteoarthritis, diabetes, chronic obstructive pulmonary disease, cataract and refractive error and anemia.(6)

Apart from diabetes and cardio vascular diseases, anemia is an important co-morbid condition and always posing a major public health problem across all ages in our nation. Especially anemia among the elderly is also associated with a wide range of complication, including increased risk of mortality and morbidities like cardiovascular disease, cognitive dysfunction, reduced bone density, malnutrition and longer periods of hospitalization for elective procedures(7) and all these health problems when compounded with depression, worsens even more the clinical outcome.

Depression among the elderly impairs the functioning in daily life. Unipolar depression accounts for 5.7% of YLDs among over 60 year olds. Depression increases the perception of poor health, the utilization of medical services and health care costs. The primary health care settings have to be improvised to diagnose and treat depression among the elderly.(8)

If the quality of added years of life has to be maintained, the physical and mental health of the elderlymust be taken care of and the country's health system should adapt technology related changes in health care, strengthening of social security systems to keep in pace of growing the elderly population are needed.(9)This study focus on the prevalence of depression among the elderly and the associated factors of depression like anemia, nutritional status, co-morbidities etc.

Methodology

This is a part of a larger study whichwas conducted as a comparative community based cross sectional study on nutritional and health status of the elderly. The sample size calculated for the main study was 243 in each rural and urban areas which was based on few studies(10)(11). The study group was496 the elderly persons (60 years and above)selected from rural and urban areas of Kancheepuram District in Tamil Nadu and the study was conducted fromNovember 2015 to August 2016 with a period of field study from April 2016 to July 2016.

Data collection was done in the study area after obtaining prior permission from Institutional Ethics Committee, Madras Medical College and from The Deputy Director of Health Services (DDHS), Kancheepuram.

Study procedure

The villages where HSC (Health Sub Center) are located and the electoral wards in urban areas of Kancheepuram District were enlisted. There were 173 HSCs and 45 electoral wards, among which three HSCs and 3 electoral wards were selected by simple random sampling technique and the individuals were selected from the household list available with the health nurse. The elderly who are resident and willing were enrolled in the study. Those not available on two consecutive visits and critically ill were excluded. Data was collected on an interview schedule in the local language and the questionnaire had socio – demographic details, history of co-morbid conditions, anthropometry, nutritional assessment using Mini Nutritional Assessment (MNA) scale, Hemoglobin estimation by Cyano-methemoglobin method and depression scale.Each participant was given a brief introduction about the study and informed written consent was obtained from all participants (In illiterate elders, a thumbprint was taken in front of witnesses. After completing the questions and viewed the health records at their homes, anthropometry were measured and two milliliters of blood was drawn to estimate hemoglobin in the sub center (Rural areas) and ICDS centers (Urban areas) where emergency medicines were kept ready.

The details of co-morbid conditions were elicited from the history and the medical records available. Anthropometric tools: weighing machine (Weight measurement), stadiometer (Height measurement), measuring tape (Mid upper arm circumference&Calf circumference measurement) were used.

Nutritional assessment was done using Body Mass Index (BMI) and with Mini Nutritional Assessment (MNA) of Nestle Nutrition Institute which is a validated tool. MNA classification is based on scores: Scores of 24 – 30 are considered Normal; 17 – 23.5 indicate at risk of malnutrition; Less than 17 points indicate Malnutrition. The questions were probed using MNA guide (12). The presence of depression was assessed using Geriatric Depression Scale – Short Form (15 questions) and was graded as per the scores provided(13). The Tamil version by Cynthia SwarnalathaSrikesavan of the University of Manitoba, Canada was used(14). The GDS was found to have a 92% sensitivity and 89% specificity when evaluated against diagnostic criteria(15). Hemoglobin was estimated by cyano-methemoglobin method using drabkin's solution whose quality control was ensured by analyzing standard sample before checking for the test samples using semi auto-analyzer by a lab technician with proper universal precautions.Hemoglobin levels to diagnose anemia and the anemia cut-offs defining mild, moderate and severe anemia were according to the WHO classification.(16)Biomedical waste was segregated at the

point of production and disposed through respective Primary Health Centers and Urban Health Centers.

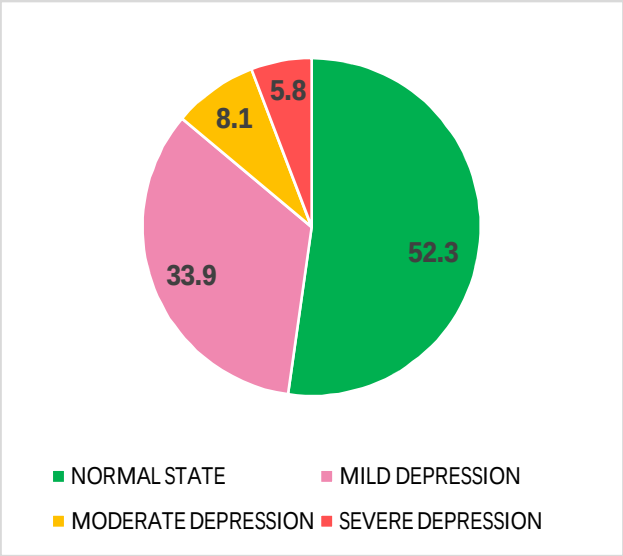
Data analysis: The responses were verified twice, entered and analyzed using IBM SPSS version 16.0. The descriptive and inferential statistics of the responses to the questions were calculated. A two tailed p value of <0.05 was considered as statistically significant.

Results

The study population consisted of totally 496 the elderlypeople, out of which 44.8% (222 participants) were males and 55.2% (274 participants) were females. Around 49.2% belonged to urban area and 50.8% resides in rural area. Among the study population, the minimum age was 60 years and maximum was 92 years with a Mean Age (± S.D.) of 65.41 (± 5.77) years.

Distribution of depression among the study population using the GDS.: Among 496 the elderly, 47.8% (237 participants) were depressed. According to Geriatric Depression Scale, depression is classified into mild, moderate and severe and its distribution is shown in figure1.

Figure.1. Pie chart showing Distribution of depression among the study population using the GDS.



Distribution of Depression and Socio – demographic variables.

The distribution of depression and its association with the socio demographic variables viz., age, gender, residence, educational status, occupational status, marital status and type of family are depicted in table 1 and the economic and socio-economic status is shown in table 2.

Association between Depression and Co-morbidities

The association between depression and the presence of one or more co-morbidities is shown in the figure 2.The depression is more among the elderly with co-morbidities (52.4%) when compared with the elderly persons without any co-morbid conditions (39.5%) and the difference is statistically significant (p-0.006).

Figure.2. Association between Depression and Co-morbidities

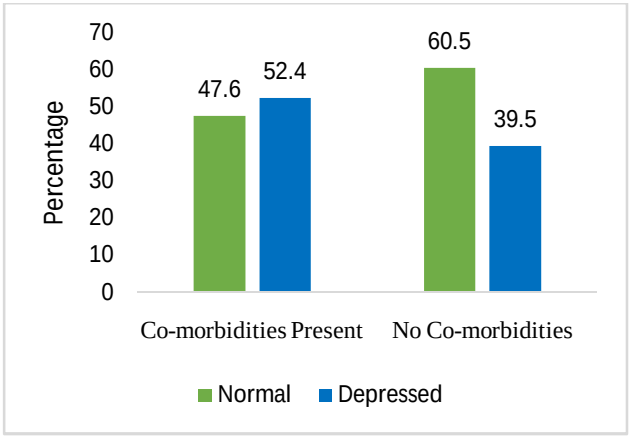
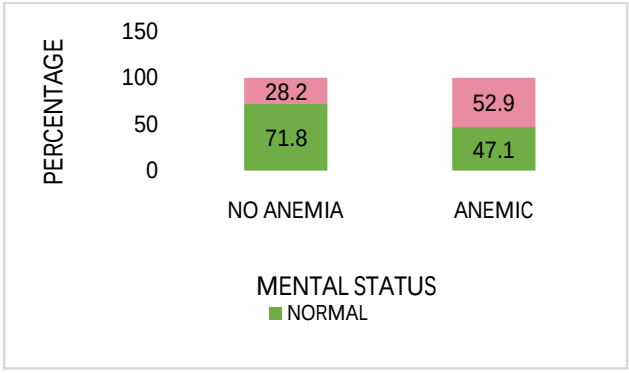
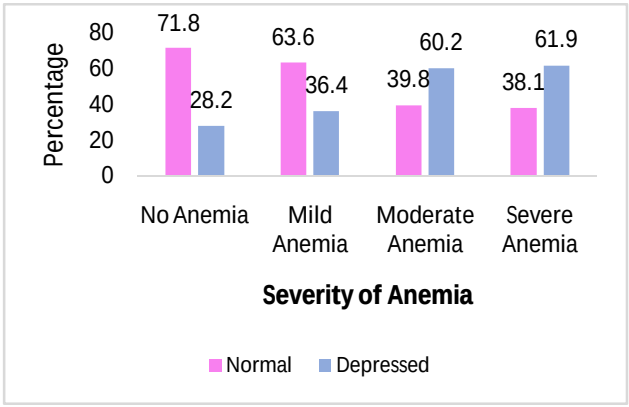


Figure.3. Distribution of Anemia and Depression in the study population.



Chi square = 20.070, df = 1, p = 0.001

Figure.4. Distribution of Severity of Anemia and Depression in the study population.



Association between Depression and Nutritional status among the study participants

The association between the nutritional status and depression among the participants is shown in the table 3. The nutritional status is assessed by both BMI as well as using MNA scale.

According to BMI, the proportion of depression is high among the elderly who were underweight when compared to the elderly people with normal weight. According to Mini Nutrition Assessment scale, depression is high among the elderly who were malnourished and at risk of malnutrition when compared to the elderly with normal nutrition status and is statistically significant.

Table.1. Distribution of Depression and Socio – demographic variables.

Criteria	Depressed N=237 (%)	Normal state N=259 (%)	Total	P value by $\chi 2$ test
Age				
60-69 Years	184 (45.3)	222 (54.7)	406	$\chi 2$ = 6.250, df = 2,p – 0.044
70-79 Years	43 (61.4)	27 (38.6)	70	
80 and above	10 (50)	10 (50)	20	
Gender				
Male	86 (38.7)	136 (61.3)	232	$\chi 2$= 13.173, df = 1, p – 0.001
Female	151 (55.1)	123 (44.9)	274	
Residence				
Rural	130 (51.6)	122 (48.4)	252	$\chi 2$= 2.973, df = 1,p – 0.085
Urban	107 (43.9)	137 (56.1)	244	
Educational Status				
No formal education	108 (58.7)	76 (41.3)	184	$\chi 2$=30.233 ,df = 4,p – 0.001
Primary school education	63 (50)	63 (50)	126	
Secondary education	34 (50)	34 (50)	68	
Higher secondary education	22 (30.6)	50 (69.4)	72	
Diploma / Degree	10 (21.7)	36 (78.3)	46	
Occupational Status				
Not working	151 (54.5)	126 (45.5)	277	Fisher exact p-0.001
Unskilled worker	56 (54.4)	47 (45.6)	103	
Semi-skilled worker	10 (41.7)	14 (58.3)	24	
Skilled worker	1 (8.3)	11 (91.7)	12	
Shop/ Land owner	19 (24.7)	58 (75.3)	77	
Professional	0 (0)	3 (100)	3	
Marital status				
Currently married	116 (34.7)	218 (65.3)	334	$\chi 2$=69.817 , df = 1,p – 0.001
Widow/Widower/Separated/Single	121 (74.7)	41 (25.3)	162	
Type of Family				
Nuclear family	52 (32.7)	107 (67.3)	159	$\chi 2$=37.582 ,df = 2,p – 0.001
Joint/Extended family	136 (49.6)	138 (50.4)	274	
Living Alone	49 (77.8)	14 (22.2)	63	

Distribution of Depression and Anemia in the study population.: The association between anemia and depression among the participants is shown in the figure 3 and the association between the severity of anemia and depression is depicted in the figure 4.Among the elderly persons with anemia, 52.9% were depressed when compared to the elderly who were having normal hemoglobin level (28.2%). The proportion of depression increases with anemia and the difference is statistically significant (p-0.001).

Table.2. Distribution of Depression and Socio – economic status.

Criteria	Depressed (n=237)	Normal state (n=259)	Total	P value by $\chi 2$ test
Economic Status				
Independent	98 (37.8)	161 (62.2)	259	$\chi 2$= 26.701
Dependent on Others	121 (56.3)	94 (43.7)	215	df = 2
Dependent on OAP*	18 (81.8)	4 (18.2)	22	p – 0.001
Socio-Economic Status				
Upper class	29 (29.6)	69 (70.4)	98	$\chi 2$=28.538
Upper middle class	32 (38.6)	51 (61.4)	83	df = 4
Middle class	53 (49.1)	55 (50.9)	108	p – 0.001
Lower middle class	94 (57.3)	70 (42.7)	164	
Lower class	29 (67.4)	14 (32.6)	43	

*OAP - Old Age Pension underIndira Gandhi National Old Age Pension Scheme.

Table.3. Distribution of Depression and Nutritional status.

Criteria	Depressed (n=237)	Normal state (n=259)	Total	P value by $\chi 2$ test
Body Mass Index				
Underweight	20 (74.1)	7 (25.9)	27	$\chi 2$= 8.040
Normal weight	125 (47)	141 (53)	266	df = 2
Overweight/Obese	92 (45.3)	111 (54.7)	203	p – 0.018
Nutritional status using MNA (Mini Nutrition Assessment) scale				
Normal Nutritional status	89 (29.4)	214 (70.6)	303	Fisher exact
At risk of Malnutrition	140 (76.1)	44 (23.9)	184	p-0.001
Malnourished	8 (88.9)	1 (11.1)	9	

On comparing the depression with the severity of anemia, the proportion of depression increases when the severity of anemia increases and is high among the elderly with severe (61.9%) and moderate anemia (60.2%) when compared to mild anemia (36.4%) and people with normal hemoglobin levels (28.2%).

Multi variate analysis

In Logistic regression, the individuals were divided into two groups – Depressed and The elderly with normal mental health status. After adjusting for other factors it revealed that the risk of developing depression depends on the elderly living alone (OR 4.52 times, CI – 2.84 to 7.19), belonging to lower socio economic status (OR 1.97 times, CI – 1.22 to 3.18), malnourished or at risk of developing malnutrition(OR 5.8 times, CI – 3.69 to 9.13), presence of co-morbid conditions (OR 1.79 times, CI – 1.13 to 2.82) shown in table 4.

Table 4:Independent risk factors for the risk of developing depression among the elderly.

Variables	B	S.E	Wald	df	Sig	Exp(B)	95% C.I for Exp(B)	
							Lower	Upper
Marital status	1.508	0.237	40.38	1	0.001	4.517	2.837	7.192
Socio – economic status	0.679	0.244	7.772	1	0.005	1.972	1.223	3.178
Nutritional status (MNA)	1.758	0.231	57.87	1	0.001	5.803	3.689	9.129
Co-morbidities	0.58	0.234	6.153	1	0.013	1.786	1.129	2.824
Constant	-2.05	0.287	53.12	1	0.001	0.129		

Discussion

In this community based study, the prevalence of depression among the elderly was 47.8% which is supported by few studies (8,17). The prevalence of depression was high in a study done in north India (61.4%) which is a hospital based study(18)and also in a kanchipuram district study (19)done in an old age home. The proportion of mild, moderate and severe depression were 33.9%, 8.1% and 5.8% respectively.

The depression is high among females than male the elderly and is supported by the studies done in our country(18,20)and also in various countries(17,21)

Among the social factors, the elderly with no formal education or having lower educational status compared to the elderly with high school, diploma/degree education, the elderly who are not working or working as laborers, lower socio economic status compared to upper class, people depending only on government old age pension scheme as financial assistance, single/ widow / widower compared to currently married and living with spouse, living alone were significantly associated with depression. This implies that depression among the elderly depends on multiple social factors and few factors were supported by some studies.(17,22,23)

Depression is significantly associated with the presence of co-morbid conditions (like diabetes, hypertension, anemia, malnutrition etc.,) and is corroborated by an Indian study.(22)Depression is also significantly associated with the nutritional status of the elderly. According to BMI, the depression is high among the elderly who were underweight and according to MNA scale, the depression is high among malnourished (88.9%) and among the elderly at risk of malnutrition (76.1%) when compared to the elderly who were having normal nutritional status and is corroborated with some studies.(21,24,25)Depression is significantly associated with the presence of anemia among the elderly and is supported by a study done in Chianti(26) and in Sao Paulo (27)As the severity of anemia increases, the proportion of depression also increases from 36.4% in the elderly with mild anemia to 61.9% in the elderly with severe anemia.

Binary logistic regression analysis showed that the increase in the burden of depression is significantly associated with lower socio economic status,the elderly who were widow/widower/ separated compared to currently married, the elderly who are malnourished or at risk of malnutrition and the presence of co-morbidities.

The adjusted odds ratio for developing depression among the elderly due to their nutritional status is 5.8 times higher among those who were malnourished or at risk of malnutrition (95%CI – 3.689 – 9.129), 4.5 times higher chance of developing depression among the elderlywho were widow/widower/separated (95%CI - 2.837 – 7.192), belonging to lower Socio economic status is having two times higher risk of developing depression (95%CI - 1.223 – 3.178) andthe presence of co-morbidities is having 1.8 times higher chance of developing depression (95%CI - 1.129 - 2.824).

Conclusion

In our community based study, nearly half of the elderly were depressed. There was a significant association between depression in the elderly and lower socio economic status, poor nutritional status, presence of co-morbidities like diabetes, cardio vascular diseases, among the elderly currently not living with their spouse and have a significant negative effect on the mental health status of the elderly.

These indicates an urgent need of comprehensive screening for the elderly along with mental health services and health education in the primary health care settings, with proper counselling to the elderly as well as to their care givers for a good care and support along with rehabilitative services.

Limitations of the study

Co- morbidities were self – reported or medical report based, hence the morbidity profile of the study population may have been under estimated. Participants may feign to give the real picture of their health related history so as to project them a good or bad image over their health pattern. This may lead to a possibility of bias in the study.

Anemia among depressed is high but it’s a chicken-and-egg phenomenon which could not be explained in this study.

Recommendations

Screening for Depression is mandatory for all the elderly and this can be added in National Programme for prevention of cardio vascular diseases, diabetes, cancer

and stroke (NPCDCS) as depression is a major determinant of quality of life in the elderly.

As depression is high among elders, proper counselling should be given before health education to improve the interaction at the primary health care level. Geriatric health care melas can be conducted to render special care for the elderly and health education should be given to the elderly about lifestyle modification (Physical activity, healthy diet) and to the care givers especially through ASHAs and Outreach services.

Financial independency and autonomy should be ensured to the elderly by the policy makers through social security schemes, employment opportunities and special health insurance coverage for in-patient, out-patient as well as for periodic screening procedures to reduce health inequities.

The elderly welfare societies can be started at the panchayat level to know their felt needs and also utilizing their experiences and knowledge by involving them in village administration will help to preserve their mental health and social interaction. In the same way, the elderly people should be attached with the day care centers which will benefit in both ways.

Further analytical studies are needed to find out the direct or indirect association of anemia and depression. Interventional studies are needed to analyze the effect of counselling, health education and to formulate treatment guidelines for anemia among the elderly to improve the quality of life among the elderly.

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