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Depression and Cognitive Impairment among the Elderly in Rural and Urban Areas of Shimoga

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ABSTRACT

Background: Elderly people suffer from communicable and non-communicable diseases. This is compounded by impairment of sensory functions like vision, hearing, and stability management leading to cognitive impairment. Elder mistreatment, financial exploitation, psychological abuse and abandonment may have serious medical and social consequences like depression

Objective: The study was conducted to assess the burden of depression and cognitive impairment among the elderly persons in a rural and urban field practice areas of Shimoga Institute of Medical sciences, Shimoga.

Methods: A cross sectional study was conducted among elderly in rural and urban field practice areas of Shimoga Institute of Medical Sciences, Shivamogga. Data was collected by doing house-to-house visits after informed consent with semi-structured, pre-designed and pre-tested questionnaire. Analysis was done by using SPSS version 21 software. Proportions and frequencies were calculated, the Chi Square statistical test was used to analyze the association between variables.

Conclusion: The study concluded that the prevalence of depression in rural elderly was established to be 60/210(28.6%) while in urban elderly it was 85/210(40.5%). Based on MMSE for assessing cognitive impairment showed 20% (42), 2.9% (6) had mild and moderate impairment respectively in rural areas where as in urban 38.1%(80), 14.3%(30) had mild and moderate impairment respectively.

Key Words: elderly, depression, cognitive impairment, MMSE

INTRODUCTION

Old age is an incurable disease.[1] In India; people aged 60 years and above are treated as old. People aged between 60 to 75 years are young old, between 75 to 85 as old-old and above the age of 85 are classified as very old or infirm. Aging is a physiological process that starts from birth, continues throughout life and ends with death. 'Senescence' means deterioration in the vitality or lowering of the biological efficiency or feebleness of the body and mind, associated with the process of aging.[2]

According to Census 2011 nearly 104 million elderly persons were estimated in India; 53 million females and 51 million males. From 5.6% in 1961, the proportion has increased to 8.6% in 2011.[3] As regards rural and urban areas, 71% of elderly population resides in rural areas while 29 % is in urban areas.[4] The 2011 census reveals that Karnataka has 7.9% elderly population and stands 7th in India in terms of percentage of old age population. The urban proportion (8.4%) of aged population in Karnataka is more than the corresponding rural share (6.9).[5]

Elderly people suffer from both communicable as well as non-communicable diseases. Further, this is compounded by impairment of sensory functions like vision, hearing, and stability management leading to cognitive impairment. Poor life style,

decline in immunity as well as age-related physiologic changes lead to an increased burden of communicable diseases in the elderly.[5]

Elder mistreatment, including physical abuse, sexual abuse, neglect, financial exploitation, psychological abuse and abandonment is common and may have serious medical and social consequences like depression.[6]

In this context, the present study was aimed to estimate the burden of depression and cognitive impairment among the elderly persons in a rural and urban field practice area of Shimoga Institute of Medical sciences, Shimoga.

METHODOLOGY

A community based cross sectional study was conducted among elderly residing in rural and urban field practice areas of Shimoga Institute of Medical Sciences, Shivamogga for 6 months, from March-2018 to August-2018. Ethical permission was taken from institutional ethical committee .One village and one ward were randomly picked up from the rural and urban field practice areas respectively for the study. All households in the selected villages / wards were included in the study.

Considering the prevalence of depression to be 15% [13] among elderly people at 5% precision, sample size is calculated by using the formula $4pq / d^2$, where p is prevalence, q is (1-p) and d is precision. It was estimated to be 204, rounded off to 210. Hence 210 participants in urban field and 210 participants in rural field was studied and analyzed.

In a selected village in rural and ward in urban area, a central place was chosen, all houses towards the right side were surveyed for persons completed 60 years till the required number of 210 people interviewed. If required number was not available at one side of the village then after coming back to the central place another side was chosen. In same household if there were more than one aged person present then all of them were included in the sample and interviewed. Locked houses and houses in which the elderly member / s were temporarily absent would be visited second time. If any aged household member was absent during second visit, he / she was not included in the sample.

After taking informed written consent, data was collected by doing house-to-house visits with semi-structured, pre-designed, pre-tested questionnaire,Geriatric Depression Scale (GDS)[7] and Mini Mental State Examination(MMSE)[8] were used and analysed using SPSS version 21 software. Results are described in proportions and chi square test was used to find the associations.

RESULTS

This study was conducted in rural and urban field practice areas of Shimoga Institute of Medical Sciences among elderly population. A total of 210 elderly each from rural and urban area were selected. A few background characteristics of the elderly study participants are;

Socio-demographic characteristics of elderly study subjects:

Among study subjects, majority in both rural and urban groups belonged to age group of 60-65 years [60% (rural), 52.4% (urban)] followed by 66-70 years [25.7% (rural), 23.8% (urban)]. The proportion of females among the elderly population was 53.3% (112 / 210) in rural and 54.8% (115 / 210) in urban area compared to males 46.7% (98 / 210) and 45.2% (95 / 210) respectively in rural and urban areas. There was no significant difference in gender distribution of the elderly between rural and urban subjects. (χ^2 = 0.173, df= 1, p value= 0.68). (TABLE1)

Above table (Table 2) shows that out of 210 elderly each in rural and urban areas majority of the elderly belongs to Hindu religion 70% and 81% respectively. A total of 42.9% of study participants were leading widow / widower life in urban areas compared to 7.1% in rural areas. At the time of survey 91.4 % and 57% were married in rural and urban areas respectively. Maximum number of participants were illiterate (75.7%) in rural and (66.7%) in urban areas.

Most of the elderly were not working 95.7% and 64.3% in rural and urban areas respectively. In rural area around half 45.7% were living in joint families, while 61.9% were living in nuclear family in urban areas.

Table 1: Distribution of study subjects according to Age and Gender

Locality	Gender	Age in years					
		60-65yrs	66-70yrs	71-75yrs	76-80yrs	81 -85yrs	Total (100%)
URBAN	Female	65 (56.5%)	25 (21.7%)	20 (17.4%)	0 (0%)	5 (4.3%)	115
	Male	45 (47.4%)	25 (26.3%)	25 (26.3%)	0 (0%)	0 (0%)	95
RURAL	Female	80 (71.4%)	18 (16.1%)	14 (12.5%)	0 (0%)	0 (0%)	112
	Male	46 (46.9%)	36 (36.7%)	13 (13.3%)	3 (3.1%)	0 (0%)	98

(Figures in parenthesis indicate row percentage)

Table 2. Demographic variables of the study subjects in rural and urban areas

Variables	Rural (%)]	Urban (%)]
Religion		
Hindu	147 (70%)	170(81%)
Muslim	63 (30%)	35 (16.7%)
Christian	0 (0%)	5 (2.4%)
Marital status		
Married	192 (91.4%)	120 (57.1%)
Unmarried	3 (1.4%)	0 (0%)
Widow / widower	15 (7.1%)	90 (42.9%)
Education		
Illiterate	159 (75.7%)	140 966.7%)
Primary	30 (14.3%)	30 (14.3%)
High school	12 (5.7%)	10 (4.8%)
Puc	3 (1.4%)	5 (2.4%)
Graduate and above	6 (2.9%)	25 (11.9%)
Employment		
Employed	9 (4.3%)	75 (35.7%)
Unemployed	201 (95.7%)	135 (64.3%)
Family		
Nuclear	48 (22.9%)	130 (61.9%)
Three generation	66 (31.4%)	55 (26.2%)
Joint	96 (45.7%)	25 (11.9%)
Living with		
Alone	12 (5.7%)	20 (9.5%)
Spouse	12 (5.7%)	40 (1.9%)
Children	66 (31.4%)	80 (38.1%)
Spouse and children	120 (57.1%)	70 (33.3%)
Socioeconomic status		
Class 1	99 (47.14%)	75 (35.7%)
Class 2	45 (21.4%)	5 (2.4%)
Class 3	18 (8.6%)	100 (47.5%)
Class 4	45 (21.4%)	30 (14.3%)
Class 5	3 (1.4%)	0 (0%)

(Figures in parenthesis indicate percentage)

Common living arrangement was living with spouse and children in rural (57.1%) and urban (33.3%) areas followed by living with children 31.4% (rural) and 38.1% (urban).

The socio-economic status of the study population was classified according to the modified B G Prasad classification. About half of study population in rural area belong to class 1 (47.14%) and 35.7% in urban area, followed by class 2 (21.4%) in rural and class 3 (47.5%) in urban areas. Class 4 (21.4%) were more in rural area compared to urban (14.3%). (Table 2)

The prevalence of depression in rural elderly was established to be 60/210(28.6%) while in urban elderly it was 85/210(40.5%). TABLE 3 shows, females (53.3% rural, 58.8% urban) were affected more compared to males (38.3% rural, 41.2% urban) both in rural and urban areas. 33.3% of those aged 71-75 years followed by 60-65years(28.6%) were depressed in rural(χ^2=35.5,df=6,p value= 0.001) whereas in urban 76-80 years aged were more depressed (χ^2=57.1, df=6, p value= 0.001). It was evident that socioeconomic status, living alone, employment status and education were significant to depression both in rural and urban areas. But there was no statistical difference between depression in urban and rural areas. (χ^2=3.062, df=4,p = value= 0.547). Many determinants like alcohol (χ^2=18.5, df =2, p value= 0.001), smoking (χ^2=11.1df=2, p value= 0.004) and physical activity (χ^2=51.5, df=4, p value= 0.001) were statistically significant in urban areas but not so in rural areas.

Table 3: Prevalence of Depression among elderly in rural and urban areas

Depression	Rural			Urban		
	Males(N)	Females(N)	Total (%)	Males(N)	Females(N)	Total (%)
Not Depressed	50	50	62.9	52.2	47.8	54.8
Uncertain	50	50	8.6	0	100	4.8
Depressed	38.3	53.3	28.6	41.2	58.8	40.5

Table 4: Prevalence of Cognitive impairment among elderly in rural and urban areas

Cognitive Impairment (Mmse)	Rural			Urban		
	Males(N)	Females(N)	Total (%)	Males(N)	Females(N)	Total (%)
Normal	48.1	51.9	77.1	50	50	47.6
Mild Impairment	33.3	66.7	20	25	75	38.1
Moderate Impairment	100	0	2.9	83.3	16.7	14.3

Based on MMSE, a screening test for assessing cognitive impairment showed 20% (42), 2.9% (6) had mild and moderate impairment respectively in rural areas where as in urban 38.1%(80), 14.3%(30) had mild and moderate impairment respectively. Prevalence was higher in urban subjects than in rural. Females were more affected than males both in rural and urban areas. No statistical difference was found between rural and urban areas for cognitive impairment. (TABLE 4)

DISCUSSION

Socio-demographic characteristics of elderly study subjects: A total of 210 elderly each from rural and urban areas were selected. Among study

subjects, majority in both rural and urban groups belonged to age group of 60-65 years [60% (rural), 52.4% (urban)] followed by 66-70 years [25.7% (rural), 23.8% (urban)] similar to the study conducted by verma.v.et al.[9] showed that in both rural and urban study population belonged to the age group of 60-70 years followed by 70-80 years. Similar results were also found in a study by R P Thakur [10]

The proportion of females among the elderly population was 53.3% (112/210) in rural and 54.8% (115/210) in urban area compared to males 46.7% (98) and 45.2% (95) respectively in rural and urban areas. Almost same results in a study by R P Thakur where females (61.76%) in rural areas and 61.57% in urban areas was observed.[10]

A total of 42.9% of study participants were leading widow/widower life in urban areas compared to 7.1% in rural areas. Similar to a study conducted in Shimla a total of 27.5% were leading widowed life.[11]The higher rate of widow/widowers in present study has potential to affect adversely the health of the elderly.

At the time of survey 91.4 % and 57% were married in rural and urban areas respectively. In a study by R P Thakur[10] out of 407 study participants in rural and urban areas 51.1% were found to be married similar to our study.

Maximum number of participants were illiterate (75.7%) in rural and (66.7%) in urban areas similar to findings in a study at Vishakhapatnam district where out of total study population 75.75% were illiterate.[12] The higher rural literacy among elderly is the challenge to geriatric health issues as literacy has a positive impact on overall health.

Most of the elderly were not working 95.7% and 64.3% in rural and urban areas respectively. Verma v ., [9] study showed overall 53% of elderly were not working.

In rural area around half 45.7% were living in joint families, while 61.9% were living in nuclear family in urban areas. Similar findings were found by Verma v ., [9]

Common living arrangement was living with spouse and children in rural (57.1%) and urban (33.3%) areas followed by living with children 31.4% (rural) and 38.1% (urban). Similar results in a study done in Shimla where living with spouse and children (65%) and children (24.8%) were obtained.[11]

About half of study population in rural area belong to class 1 (47.14%) and 35.7% in urban area, followed by class 2 (21.4%) in rural and class 3 (47.5%) in urban areas. Class 4 (21.4%) were more in rural area compared to urban (14.3%) which is in contrast to results obtained by R P Thakur[10] in which majority of elderly belonged to lower socioeconomic status (45.6%).

The prevalence of depression in rural elderly was established to be 60/210(28.6%) while in urban elderly it was 85/210(40.5%) which almost relates to the results of the study conducted by Barua et al[13], which concluded that the median prevalence rate of depression among the elderly Indian population was determined to be 21.9% (IQR, 11.6%–31.1%).

Similar findings were observed in the studies conducted by Nandi DN et al[14] and Ramachandran v et al[15] which revealed that the point prevalence of depressive disorders in elderly Indian population varies between 13% and 25%.

Of 560 participants in a study conducted by Patel RM et al, 140 (25%) had Cognitive impairment similar to our study findings. Female (29.8%) prevalence was higher than male (19.1%) prevalence which almost resembles our study findings. Urban area showed higher prevalence than rural area in our study in contrast to the findings of the study conducted by Patel RM et al.[16]

Limitations

Shorter study duration, Smaller sample size and results can't be generalized due to smaller area consideration.

CONCLUSION

The prevalence of depression is increasing both globally and nationally which needs attention and care, family support, provision of services and treatment facilities at hospitals. Cognitive impairment can be delayed with proper social, family and financial support with good health care services.

These problems needs policy changes at national level and awareness generation at grass root level.

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Annexure: Tools for study:

Geriatric Depression Scale (GDS):

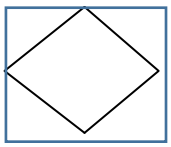
This is suitable as a screening test for depressive symptoms in the elderly. The 4 item Geriatric Depression Scale is easy and quick to perform with a high sensitivity and specificity. GDS-4 is of limited clinical value in monitoring the severity of the depressive episode but more useful in excluding depression. If depression is indicated the GDS-15 scale should be used for further evaluation.

4 item GDS Questions	Circle One Answer	Score
Are you basically satisfied with your life?	Yes	No
Do you feel that your life is empty?	Yes	No
Are you afraid that something bad is going to happen to you?	Yes	No
Do you feel happy most of the time?	Yes	No

Mini mental state examination (MMSE):

Score: If answer chosen is in CAPITALS then give 1 mark otherwise 0
Results: 0 = Not Depressed, 1 = Uncertain, 2 to 4 = Depressed
MMSE: 1 Normal; 2 Mild impairment; 3 Moderate impairment; and 4) severe impairment

1. What is the? a) Year b) Season c) Date d) Day e) Month ____ (5)
2. Where are we now? a) Country b) District c) Town d) Village e) Locality_____(5)
3. Name three objects Mango, Chair, Coin and ask patient to repeat: _____ (3)
4. Ask patient to tell names of days of the week starting from Sunday, backwards: ____(5)
5. Earlier I told you the names of three things. Can you tell me what those were? _____ (3)
6. Show patient 2 simple objects, like watch & pen, ask the patient to name them: _____ (2)
7. Repeat the phrase: 'Neither this nor that.'": _____ (1)
8. Take the paper in your right hand, fold it in half, and put it on the floor: ____(3)
9. Examiner says "Look at me and do exactly what I do"&Close his own eyes for 3 sec___(1)
10. Tell me something about your house ____(1)
11. Please copy this picture (All 10 angles must be present and two must intersect): ____ (1)



Score: 25 and above Normal, 20-24 Mild impairment, 11-19 Moderate, 0-10 Severe impairment.