



Original Research Article

Prevalence of cognitive impairment and depression among elderly population in urban Chitradurga

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ABSTRACT

Background: Population aging is an emerging issue of developed as well as developing countries. Cognitive impairment (CI) is defined as “confusion or memory loss that is happening more often or is getting worse during the past 12 months”. Depression is a mental state disorder characterized by persistent depressed mood or loss of interests in activities causing significant impairment in daily life. Regular physical activities, control of blood sugar and cholesterol can reduce the risk of both cognition and depression. Thus the objectives of the study were to find the prevalence of cognitive impairment and depression among elderly and to detect association between cognitive impairment and depression among elderly in urban filed practice area of Chitradurga.

Materials and Methods: This cross sectional study was carried out in urban areas of Chitradurga, from February to April 2019. The study participants were geriatric age population with age more than or equal to 60 completed years. A sample size of 280 was obtained with sample prevalence being 58.9% and margin of error 10%. Data was collected using standardized pre-tested structured questionnaire, which included socio-demographic variables, mini mental state examination (MMSE) scale to detect cognitive impairment and geriatric depression scale (GDS) short version to identify depression. Data was entered & analyzed using SPSS 20. Chi- Square test was used. P value <0.05 was considered significant.

Results: The prevalence of cognitive impairment and depression in the elderly was noted to be 33.6% and 60% respectively. Factors showing significant association with MMSE score included older age group, male gender, single/widowed status, and elderly belonging to lower socioeconomic status, joint family and illiteracy. The association between cognitive impairment and depression was found to be statistically significant with a p value of <0.001.

Conclusions: There is an association between cognitive impairment and depression. Therefore it is essential to screen elderly for depression scale while assessing cognitive impairment.

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1. Introduction

Ageing is a natural process. In the words of Seneca; “Old age is an incurable disease”, but more recently, Sir James Sterling Ross commented: “You do not heal old age. You protect it; you extend it”.¹

Cognitive impairment (CI) is defined as “confusion or amnesia that’s happening more often or is getting worse during the past 12 months”.² Aging is considered as the main reason behind it; however, other factors such as

literacy, family history, injury to brain, etc. along with diseases like Parkinson’s also contribute in the development of cognitive impairment.² It has likewise been documented that the aged are more prone to psychological troubles and depression is the commonest among them, in fact the elderly in India face a multitude of psycho-societal, societal and physical health problem. Regular physical activities, control of blood sugar and cholesterol can reduce the risk of both cognition and depression.² In last census 2011, 11% globally and 8% Indian population are above 60 years and would reach 19% by 2050. Subject areas of cognitive impairment reported a prevalence of 22.2%.³ The

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prevalence of cognitive impairment in Bangalore is 58.9%.⁴ No research related to cognitive impairment among elderly was conducted in urban field practice area of Chitradurga district of Karnataka State. Hence this survey was planned with the objective to find the prevalence of cognitive deterioration in this region and identify the elements linked with cognitive impairment so that timely and appropriate preventive steps can be adopted.

2. Materials and Methods

2.1. Study type

The cross-sectional study was held out in the urban field practice area of Chitradurga district in 2019 after looking for permission from the ethics committee of the foundation. The study participants were of geriatric age group population with age more than or equal to 60 completed years.

Aim and nature of the study were explained to the participants. Confidentiality has been assured and written & informed consent was taken.

2.2. Sample size

The sample size was 280 calculated by the following formula.

$$N = 4pq/d^2$$

p = prevalence of cognitive impairment. i.e 58.9% = 0.589⁴

$$q = 1-p \text{ i.e. } 1-0.589 = 0.411$$

$$d = \text{relative error i.e. } 10\%$$

$$= 4 * 0.589 * 0.411 / 0.00346921$$

$$= 279.11 \approx 280$$

2.3. Study duration

This study was conducted for the duration of three months (February-April 2019)

2.4. Sampling method

Simple Random sampling was performed among the survey participants by lottery method.

2.5. Inclusion criteria

1. Geriatric population with age group of 60 & above.
2. No chronic comorbidities.

2.6. Exclusion criteria

1. Non-cooperative, terminally ill, bed ridden persons without dementia and persons with savior speech, visual, and hearing impairment were excluded from the survey.
2. Mental health disorders.
3. Those who were not ready to participate in the study.

2.7. Study tool / study material

Standardized questionnaire was utilized which included three components:

1. Sociodemographic profile
2. Mini-Mental State Examination: Assessment of cognitive status by the Folstein Mini-Mental State Exam is widely practiced. It briefly measures orientation to time and place, registration, immediate recall, short term verbal memory, calculation, language, constructs ability.⁵ A set of 26 questions which included Mini-mental state examination and Geriatric depression scale were applied. Scores less than 22 were considered as cognitive impairment and more than 22 as normal.
3. Geriatric Depression Scale assessment tool.

2.8. Data entry

The data obtained was entered into Microsoft Excel sheet and analyzed using SPSS software version 20. Results explained as frequency and percentages. The qualitative data were analysed by applying chi - square test to find the significant association between sociodemographic factors and cognitive impairment.

3. Results

3.1. Socio- demographic profile of the elderly population

The socio-demographic profile of the study population shows that the majority of the elderly included in the study were of age 60-69 years (44.3%) followed by 70-79 years (36.4%), 80 years & above (19.3%). The sex compositions revealed that majority of elderly were females (54.3%). As per literacy status it was observed that the proportion of literates were higher (81.4%) than the illiterates (18.6%). Currently married were found to be at higher proportion (71.6%) as compared to the widow (21.1%) in the study population.

3.2. Association of cognitive impairment with various socio-demographic factors

The prevalence of cognitive impairment was significantly associated with the age. As the age advances the prevalence of cognitive impairment significantly increased. The prevalence among the age group 80 years & above was 44.4%, followed by 70-79 years (31.4%), 30.6% in the age group 60-69 years. Elderly males had significantly higher prevalence of cognitive impairment (37.5%) as compared to elderly females (30.3%). Currently married elderly had significantly lower prevalence of cognitive impairment (30.5%) as compared to the widow elderly (75%). Illiterate's had significantly higher prevalence of cognitive impairment (55.8%) than the literate's. Joint families had

Table 1: Distribution of cognitive impairment according to various socio-demographic variables.

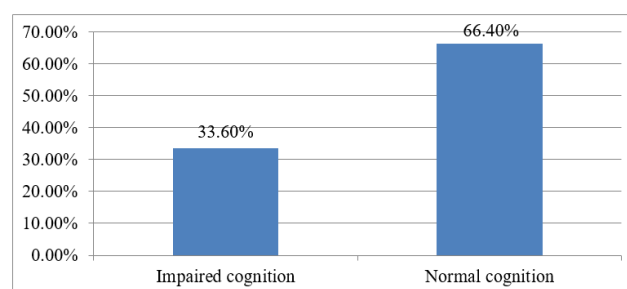
Socio-demographic variables	MMSE Score		Total	P-value
	Impaired cognition (<22)	Normal cognition (22-30)		
Age				
60-69	38 (30.6%)	86 (69.4%)	124	0.019
70-79	32 (31.4%)	70 (68.6%)	102	
80-90	24 (44.4%)	30 (56.5%)	54	
Gender				
Male	48 (37.5%)	80 (62.5%)	128	0.045
Female	46 (30.3%)	106 (69.7%)	152	
Marital Status				
Married	65 (30.5%)	148 (69.5%)	213	0.020
Divorced	6 (7.5%)	2 (2.5%)	8	
Widow	23 (39%)	36 (61%)	59	
Education				
Profession	2 (9.5%)	19 (90.5%)	21	<0.001
Graduate	11 (22.9%)	37 (77.1%)	48	
Post high school	14 (53.8%)	12 (46.2%)	26	
High school certificate	17 (26.2%)	48 (73.8%)	65	
Middle school certificate	10 (28.6%)	25 (71.4%)	35	
Primary school certificate	11 (33.3%)	22 (66.7%)	33	
Illiterate	29 (55.8%)	23 (44.2%)	52	
Family type				
Nuclear	47 (28.8%)	116 (71.2%)	163	0.015
Joint	47 (40.2%)	70 (59.8%)	117	
SES				
Class I	25 (20.8%)	95 (79.2%)	120	<0.001
Class II	27 (39.1%)	42 (60.9%)	69	
Class III	27 (47.4%)	30 (52.6%)	57	
Class IV	15 (53.6%)	13 (46.4%)	28	
Class V	0	6 (100%)	6	

significantly higher prevalence of cognitive impairment (40.2%) than the nuclear families (28.8%). The prevalence of cognitive impairment was significantly associated with the socioeconomic status. As the socioeconomic status decreases the prevalence of cognitive impairment significantly increased (Table 1).

3.3. Prevalence of cognitive impairment among elderly population

The study revealed that the prevalence of cognitive impairment among urban elderly population in Chitradurga district was 33.6% (Figure 1).

The prevalence of depression measured with geriatric depression scale among elderly population revealed that 60% were depressed (Figure 2).

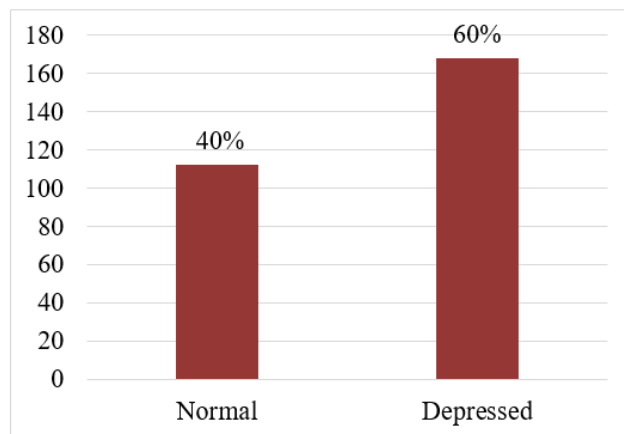
**Fig. 1:** Prevalence of cognitive impairment among elderly population in Chitradurga district

3.4. Relationship between cognitive impairment and depression

There was a significant association between cognitive impairment and depression among the geriatric people. Out of 94 geriatric residents with impaired cognition, 84% were found to be in depression (Table 2).

Table 2: Relationship between cognitive impairment and depression.

MMSE scale GDS scale	Impaired cognition	Normal cognition	Total	p- value
Normal	15 16.0%	97 52.2%	112 40.0%	<0.001
Depression	79 84.0%	89 47.8%	168 60.0%	
Total	94 100.0%	186 100.0%	280 100.0%	

**Fig. 2:** Prevalence of depression among elderly population in Chitradurga district

4. Discussion

The present cross-sectional study was conducted to evaluate the prevalence of cognitive impairment and depression among the population 60 years and older residing in the urban area of a Chitradurga district of Karnataka.

The overall prevalence of cognitive impairment was 33.6% (Figure 1) in the present study population. Prevalence of cognitive decline among male study participants was 37.5%. Prevalence of cognitive decline among female study participants was 30.3%. The study done in Bangalore showed 58.9% prevalence of cognitive impairment.⁴ Maroof M et al⁵ showed 16%, Kumar DN et al⁶ showed 31%, and Jadav P et al⁷ showed 23.5% prevalence of cognitive decline in their studies. Studies done in Varanasi, Uttar Pradesh⁸ showed 43% prevalence of cognitive decline in old age. Lower prevalence than the present study were also read across various offices in the Indian Subcontinent. Sengupta, P et al⁹ showed 8.8% prevalence in their studies in Ludhiana while Sharma D, et al¹⁰ showed 3.5% prevalence in Shimla. Heterogenous sample size and sampling methodology are probable explanation for that.

Illiteracy is significantly associated with cognitive decline in the present study with the prevalence of 55.8% and $p=0.000$. Similarly illiterates elderly had significantly higher prevalence of cognitive impairment of 20.7% with p

value of 0.007 and 67.1% in the study conducted by Maroof M et al⁵ and Kumar DN et al⁶ respectively.

Prevalence of cognitive decline among people belonging to the age group 80-90 has a higher cognitive impairment 44.4%, but it is shown that increasing age leads to a decrease in the brain volume, loss of integrity of the myelin sheath, thinning of cortex and impaired secretion of neurotransmitter like serotonin, acetylcholine. These changes lead to decreased ability to concentrate and decreased recalling capacity.^{11,12} Various studies in the past showed positive association between increasing age and cognitive decline.^{3,6,8,11,12}

Prevalence of cognitive decline among married people was 30.5%. Similar effects were noted in the past researches done by Maroof M et al⁵ and Kumar DN et al.⁶

Prevalence of cognitive decline among semi-skilled workers was found to be 58.3%. Similar effects were noted in the past researches done by Maroof M et al⁵ and Kumar DN et al.⁶

Prevalence of cognitive decline among people belonging to joint family was found to be 40.2%. Similar effects were noted in the past researches done by Maroof M et al⁵ and Kumar DN et al.⁶

Prevalence of cognitive decline among CLASS IV (BG PRASAD) has a higher cognitive impairment with 56.6% prevalence and it is statistically significant with p -value 0.000. Similar effects were noted in the past researches done by Maroof M et al⁵ and Kumar DN et al.⁶

From the data collected it was found that out of 280 people examined, 168 (60%) were cast down and the citizenry who were depressed had higher cognition impairment of 80% with p value=0.000 and was found statistically significant. Thus, depression does one of the causal agency for impaired cognition. Our findings are similar to Senugupata P, et al⁹ and Barnes DE et al.¹³

5. Conclusion

From this study it is evident that cognitive impairment is more common among elder population residing in urban Chitradurga and several demographic factors like age, male gender, married status, illiteracy, joint family and depression were significantly connected with the cognitive decline. Therefore strengthening of the geriatric care services,

prioritizing care for the vulnerable elderly & increasing utilization of the care services through raising awareness is required.

6. Source of Funding

No funding source.

7. Conflict of interest

None declared.

8. Ethical Approval

The study was approved by the Institutional Ethics Committee of Basaveshwara Medical College and Hospital, Chitradurga, Karnataka.

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