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Original Research Article

A cross sectional observation study on quality of life and cognition in elderly population and their correlation at a tertiary care centre

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ABSTRACT

Background: India, the second most populous country is facing demographic transition. cognitive decline is one of the normative changes of aging; however, this may impact both physical and mental health of an individual. Quality of life is one of the measures of successful aging. This study was conducted to correlate the level of cognition and quality of life in elderly population. Our aim was to assess quality of life in geriatric population using OPQOL-35 and to assess cognitive assessment by MOCA and determine correlation of cognitive level with quality of life (QoL).
Methods: A cross-sectional observational study was conducted among 110 elderly adults (above the age of 60 years. Montreal cognitive assessment (MoCA) was administered to assess the cognitive level. QoL was assessed by OPQOL-35.
Results: Significant positive correlation was noted between quality of life and level of cognition scoring (with correlation coefficient 0.234).
Conclusions: The study concluded that the level of cognition and quality of life of elderly adults are in positive correlation with each other. community level screening of elderly for cognitive dysfunction can be made even in resource poor settings. Early identification and referral of elderly with cognitive dysfunction will ensure successful aging.

Keywords: Cognition, Demographic transition, Geriatric, Memory, Population aging, Quality of life

INTRODUCTION

India, the world's second most populous country, has experienced a dramatic demographic transition in the past 50 years, entailing almost a tripling of the geriatric population.[1] A substantial reduction in mortality and increase in life expectancy because of economic well-being, better healthcare system, good medicines are some of the factors that have resulted in an increase in the number of elderly persons in the population. This phenomenon, called population aging, is a dynamic phenomenon occurring worldwide.[2] The aged population is currently the second largest in the world (with 1/8th of words elderly population). It is projected to rise from 70 million, according to the National Census of 2011, to almost 324 million by the year 2050.[3] As proportion of older individuals in population grows, the rising prevalence of age-related health problems is becoming an important public health concern.

Aging is a progressive physiological decline associated with living beyond roughly the age of 30. It is a multidimensional process in humans, the process of physical, mental, psychological, and social changes. Normative changes in cognition have important effects on aging adults.

Cognition is defined as the processes in mind that produce thought- and goal-directed action. One or more

domains namely memory, attention, language, visual and constructional abilities, orientation, and calculation are affected to varying extent. Optimum cognition as a vital part of successful aging. Cognitive loss is one of the factors for poor quality of life especially in elderly population. Cognitive decline results in disability, requirement of healthcare and early mortality. it also has an impact on activities of daily living and quality of life.[2]

Determinants of quality of life in elderly are good nutrition, supportive family or care giver, physical status & mental status. Overall quality of life in elderly can be assessed by older people's quality of life (OPQOL-35), which is based on life overall, health, social relationship, independence, control of life, freedom, home and neighborhood and psychological and emotional well-being.

Elderly population at risk of developing cognitive impairment is projected to increase in future in low- and middle-income country. Health care services are often operated under constraints of trained human resources and equipment. Early detection of cognitive impairment by screening can ensure appropriate treatment and delay the progression of disease.

METHODS

This cross-sectional observational study was conducted among 110 geriatric people (January 2020 to September 2021).

Inclusion criteria

Subjects who are more than 60 years willing to consent for the study

Exclusion criteria

Subjects who are unable to comprehend the study questionnaire due to terminal illness or with physical factors that result in poor quality of life like auditory or visual impairment, dementia, bed ridden patients, patients on Ryle's tube feeding, patients with neuropsychiatric illness, patients suffering from musculoskeletal disorders, pain, and neurological disorders and acute medical illness.

Sample size was calculated by the formula

Sample size (n), $n = 4pq/d^2$,

Where n is the required sample size, p is the prevalence of obesity and q is (1-p) and d is the degree of precision. It was calculated and simple random sampling was performed.

Informed written consent was obtained from each participant and primary care giver. IEC permission was obtained prior to the study.

Study tools

Case record form was duly filled from the participants. Cognitive impairment was measured by MoCA questionnaire version 7.1 (validated Hindi and Marathi version).[5] MoCA was a 30-point test where score below 26 was considered as cognitive impairment. Almost 10 to 15 minutes was given for screening using MoCA. MoCA was filled up by participants MoCA assessed various domains of cognitive loss. The following ranges was used to grade severity: 18-25 = mild cognitive impairment, 10-17 = moderate cognitive impairment and less than 10 = severe cognitive impairment. Overall quality of life elderly was assessed by older people's quality of life (OPQOL-35).[6] This consists of 35 statements, each statement has 5 repose categories (strongly disagree', 'disagree', 'neither agree nor disagree', 'agree' and 'strongly agree', with a score ranging from of 1 to 5). Higher scores represent better quality of life. The total score ranges from 35 (worst possible QOL) to 175 (best possible QOL). Confidentiality was maintained throughout the process.

Statistical analysis

The presentation of the categorical variables was done in the form of number and percentage (%). On the other hand, the presentation of the continuous variables was done as mean±SD and median values. The following statistical tests were applied for the results: the association of the variables which were quantitative in nature were analysed using independent t test (for two groups), the association of the variables which were qualitative in nature were analysed using Chi-square test/Fisher's exact test.

The data entry was done in the Microsoft excel spreadsheet and the final analysis was done with the use of Statistical Package for Social Sciences (SPSS) software ver 21.0.

For statistical significance, p value of less than 0.05 was considered as significant.

RESULTS

The mean age of study population is 71.65 years (SD ±8) with a range of 60-88 years. More than half (55.7%) of them were male (Table 1).

In present study, 44.55% of study subjects were young old (of the age 60-69 years) followed by middle old (28.18%) (70-79 years). Only 30 out of 110 study subjects (27.27%) were old old (more than 80 years). Mean value of age (years) of study subjects was 71.65±8 with median (IQR) of 70 (66-80). Majority of females (41.30%) were old old followed by young old (34.78%) and middle old (23.91%) and majority of males (51.56%) were young old followed by middle old (31.25%) and old old (17.19%) (as shown in Figure 1).

Table 1: Demographic status of study subjects.

Demographic characteristics	Frequency	Percentage
Age category (years)		
Young old (60-69 years)	49	44.55
Middle old (70-79 years)	31	28.18
Old old (>80 years)	30	27.27
Mean±SD	71.65±8	
Median (25th-75th percentile)	70 (66-80)	
Range	60-88	
Gender		
Female	46	41.82
Male	64	58.18
Spouse		
Alive	60	54.55
Dead	50	45.45
Children		
No children	3	2.7
Children	107	97.3
Habits		
Smoking	20	18.18
Alcohol intake	17	15.45
Tobacco	36	32.73
Source of income		
No	63	57.27
Yes	47	42.73

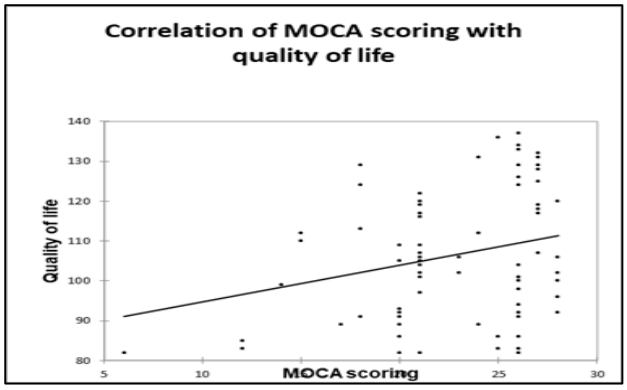

Figure 1: Correlation of MOCA scoring with quality of life.

Table 2: MOCA* score of study subjects.

MoCA score (maximum 30)	Number of study subjects	Percentage
Abnormal (<26)	60	54.55
Normal (≥26)	50	45.45
Mean±SD	23.13±4.24	
Median (25th-75th percentile)	25 (21-26)	
Range	16-28	

The cognitive impairment was present in more than half of subject 54.55%. Mean value of MOCA scoring of study subjects was 23.13±4.24 with median (IQR) of 25 (21-26) as mentioned in Table 2.

Table 3: MoCA scoring among age category.

Age group	Number of subjects with MoCA score <26	Percentage
Young old (n=49)	15	30.6
Middle old (n=31)	20	64.5
Old old	25	80.6

As shown in Tables 2 and 3, about 80.6% of old old had cognitive decline compared to 30.6% of young old. Cognitive decline increased as age advances. This was statistically significant relationship with p value <0.0001.

Mean±SD of quality of life in young old was 114.12±15.05 and middle old was 108.74±14.73 which was significantly higher as compared to old old (92.87±12.13) (p value<0.0001).

As shown in Tables 4 and 5, Mean±SD of domains of quality of life: financial circumstances, religion/culture in young old was 13.84±3.26, 2.98±1.33 respectively and in middle old was 14.42±3.53, 3.16±1.73 and in old old was 16.3±7.86, 3.53±2.08 with no significant association between them (p value>0.05). Mean±SD of domains of quality of life: overall domain in old old was 12.4±2.08 which was significantly higher as compared to middle old (10.1±2.59) and young old (8.02±2.66) (p value<0.0001). Mean±SD of domains of quality of life: health and functioning domain in old old was 10.73±1.11 and middle old was 10.48±2.57 which was significantly higher as compared to young old (9.16±3.37) (p value =0.022). Mean±SD of domains of quality of life: social relationships/leisure and social activities domain in old old was 23.67±4.54 and middle old was 21.1±4.9 which was significantly higher as compared to young old (17.63±3.21) (p value<.0001). Mean±SD of domains of quality of life: independence, control over life, freedom in old old was 17.7±2.2 which was significantly higher as compared to middle old (15.32±3.73) and young old (14.27±4.32) (p value =0.0005). Mean±SD of domains of quality of life: home and neighbourhood in old old was 11.63±2.5 and in middle old was 10.16±3.19 which was significantly higher as compared to young old (9.24±3.3) (p value=0.004). Mean±SD of domains of quality of life: psychological and emotional well-being in old old was 14.57±1.98 which was significantly higher as compared to young old (11.04±5.31) and middle old (10.77±4.4). (p value =0.0009). Among the parameters studied, financial and religion and or culture had no statistically significant correlation with quality of life. On the other hand, social relationships and social activities domain, independence, home and neighborhood and psychological and emotional wellbeing was found to have statically significant correlation with quality of life. Hence their quality of life was getting predominantly affected by the above-mentioned domains even in ambulatory patients.

Table 4: Association of quality of life with age.

Quality of life (OPQOL-35) Maximum score 175	Young old (n=49)	Middle old (n=31)	Old old (n=30)	Total	P value	Test performed
Mean±SD	114.12±15.05	108.74±14.73	92.87±12.13	106.81±16.65	<0.0001	ANOVA; F value =21.173
Median (25^{th}-75^{th} percentile)	112 (102-129)	107 (98-119)	91 (85.25-93.75)	105 (92-120)		
Range	86-137	82-133	82-129	82-137		

Table 5: Various domains of quality of life along different age groups.

Domains of quality of life	Young old (n=49)	Middle old (n=31)	Old old (n=30)	Total	P value	Test performed
Life overall domain (maximum score =20)						
Mean±SD	8.02±2.66	10.1±2.59	12.4±2.08	9.8±3.07	<0.0001	ANOVA; F value =29.024
Median (25^{th}-75^{th} percentile)	8 (6-10)	10 (9-12)	12.5 (10-14)	10 (8-12)		
Range	4-13	4-15	10-16	4-16		
Health and functioning domain (maximum score =20)						
Mean±SD	9.16±3.37	10.48±2.57	10.73±1.11	9.96±2.77	0.022	ANOVA; F value =3.956
Median (25^{th}-75^{th} percentile)	9 (7-10)	11 (9.5-12)	11 (10-11)	10 (9-11)		
Range	4-15	4-14	9-13	4-15		
Social relationships/leisure and social activities domain (maximum score = 40)						
Mean±SD	17.63±3.21	21.1±4.9	23.67±4.54	20.25±4.81	<0.0001	ANOVA; F value =20.898
Median (25^{th}-75^{th} percentile)	17 (15-19)	21 (17.5-24)	23 (23-27)	19 (16-23)		
Range	11-28	12-30	15-32	11-32		
Independence, control over life, freedom (maximum score =25)						
Mean±SD	14.27±4.32	15.32±3.73	17.7±2.2	15.5±3.92	0.0005	ANOVA; F value=8.135
Median (25^{th}-75^{th} percentile)	14 (11-18)	16 (13.5-18)	18 (17-19)	16 (13-18)		
Range	8-23	8-22	13-21	8-23		
Home and neighbourhood (maximum score = 20)						
Mean±SD	9.24±3.3	10.16±3.19	11.63±2.5	10.15±3.2	0.004	ANOVA; F value =5.622
Median (25^{th}-75^{th} percentile)	10 (7-12)	10 (7.5-12)	11 (10-13.75)	10 (8-12)		
Range	4-16	4-16	8-16	4-16		
Psychological and emotional well-being (maximum score =20)						
Mean±SD	11.04±5.31	10.77±4.4	14.57±1.98	11.93±4.63	0.0009	ANOVA; F value =7.532
Median (25^{th}-75^{th} percentile)	12 (5-16)	12 (6-15)	15 (13-16)	13 (8-16)		
Range	4-19	4-17	11-17	4-19		
Financial circumstances (maximum score =20)						
Mean±SD	13.84±3.26	14.42±3.53	16.3±7.86	14.67±5.06	0.103	ANOVA; F value =2.316
Median (25^{th}-75^{th} percentile)	14 (11-16)	16 (11.5-17)	14 (13.25-19)	14 (12-17)		
Range	8-19	7-19	8-54	7-54		

Significant positive correlation was seen between quality of life with MoCA scoring with correlation coefficient 0.234.

DISCUSSION

The study consisted of 110 elderly adults aged 60-88 years. Cognition was assessed using MoCA and QoL was assessed using OPQOL-35. The results indicate statistically significant positive correlation between cognitive level and QoL.

The results indicate statistically significant moderate positive correlation between cognitive level and QoL.

Dhara Sharma et al conducted a study in older adults and found that that the level of cognition and QoL of older adults are moderately in positive correlation with each other.[8] They explained that this can be due to changes that occur in hippocampus because of aging due to which older adults have difficulty in memorising and retrieval tasks.

Forte et al also had similar findings in a study conducted among geriatric patients and suggested that cognition and

QoL are closely related to each other. He explained that cognition, a part of executive function, involves goal-directed actions and behavioral adaptability. Core executive functions such as ability to manipulate and update information held in working memory, and ability to shift between mental sets contribute to QoL.[9]

Kim et al correlated their physical function, cognitive functions, and QoL in older adults. He concluded that there is a higher correlation found between cognitive functions and QoL than with physical functions to QoL. He explained that cognitive functions have greater influence on QoL in elderly than physical health.[10]

Glisky in 2007, explains how cognitive functions influences the QoL. Just as age-related changes in brain structure and function are not uniform across the whole brain or across individuals, age-related changes in cognition are not uniform across all cognitive domains or across all older individuals. When young adults perform the complex tasks, different areas get activated compared to older adults, especially within prefrontal cortex, indicating younger and older adults perform these tasks differently. She also adds that, not all elderly undergoes equal cognitive decline. Some may be able to retain their cognitive functions until their 70s or 80s. However, these high-functioning older adults show increased activation of their brain areas compared to younger adults. These findings suggest the compensatory mechanism adapted by aging brain. It also suggests that timely cognition training may help retain the cognitive function in elderly adults.[11]

Our study subjects did not have overt visual or hearing deficit, neuropsychiatric illness and terminally ill were also excluded. Despite this quality of life (QoL) progressively decreased across young old to old, the study subjects had mild cognitive impairment and yet it interfered with quality of life (QoL)

Limitation(s) of the study were persons with visual and auditory impairment were excluded from this study as they could not perform the tasks in MoCA. This exclusion disabled the researchers to find out burden of cognitive dysfunction in such persons. Moreover, this study was restricted to geriatric population attending OPD or accompanying them, thus future studies should be conducted among others who are not attending OPD.OPQOL-35 was not extensively studied and normative data is not available for Indian population.

CONCLUSION

Cognition training can improve cognitive function and thereby it can improve quality of life. Cognitive training should be considered as an important component of geriatric health care along with physical care.

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Conflict of interest: None declared
Ethical approval: The study was approved by the Institutional Ethics Committee

REFERENCES

1. Rowland DT, Rowland DT. Aging in Asia. Popul Aging. 2012;209-25.
2. Sharma DA, Sheth MS, Dalal DJ. Cognition and quality of life in older adults. Physiother J Indian Assoc Physiother. 2018;12(2):53.
3. Dasgupta A, Biswas A, Paul B, Roy S, Sarkar D, Ghosh P, et al. Comparative analysis of Alzheimer questionnaire and Montreal cognitive assessment tool for cognitive impairment screening among the elderly population. J Clin Diagn Res. 2020;5-9.
4. Col L, Gopal S, Mitra D. Prevalence of cognitive dysfunction among geriatric population attending outpatient departments of selected tertiary hospitals of Pune. Int J Sci Res. 2019;8(10):810-3.
5. Montreal cognitive test. Available from: https://www.mocatest.org/. Accessed on 17 February 2021.
6. A Bowling. Older People's Quality of Life Questionnaire (OPQOL-35). Available from: https://rtcom.umn.edu/database/instruments/opqol. Accessed on 17 February 2021.
7. Life overall. Available from: Older People's Quality Available at: of Life Questionnaire (OPQOL-35) https://rtcom.umn.edu/database/instruments/opqol. Accessed on 19 October 2021.
8. Nikkhah M, Heravi-Karimooi M, Montazeri A, Rejeh N, Sharif Nia H. Psychometric properties the Iranian version of older people's quality of life questionnaire (OPQOL). Health Qual Life Outcomes. 2018;16(1):1-10.
9. Sharma D, Sheth M, Dalal D. Cognition and quality of life in older adults. Physiother J Indian Assoc Physiother. 2018;12(2):53-7.
10. Forte R, Boreham CAG, de Vito G, Pesce C. Health and quality of life perception in older adults: The joint role of cognitive efficiency and functional mobility. Int J Environ Res Public Health. 2015;12(9):11328-44.
11. Kim DJ. Correlation between physical function, cognitive function, and health-related quality of life in elderly persons. J Phys Ther Sci. 2016;28(6):1844-8.
12. Glisky EL. Changes in cognitive function in human aging. Brain Aging. 2007:3-20.

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