

# Correlation between Functional Mobility and Cognition in Geriatrics

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## ABSTRACT

**Objective:** Correlational Study between Functional Mobility and Cognition in Geriatrics.

**Background:** Geriatrics is more affected by mainly mobility and Cognition. So the need of the study is to correlate between functional mobility and cognition in geriatrics.

**Methodology:** On the basis of inclusion criteria 81 subjects were taken in study. Subjects were asked to filled scale MMSE (Gujarati) followed by timed up and go test.

**Result:** Spearman correlation test was used to analyze data. Significant and negative correlation was found between TUG AND MMSE at significant level  $p < 0.05$ .

**Conclusion:** Balance and cognition was correlated in geriatric.

**Key Words:** Geriatric, cognition, functional mobility,

## INTRODUCTION

Ageing is the accumulation of changes in an organism overtime or latter part of animate life. It refers to multidimensional process of physical, social and psychological life<sup>1</sup>. According to India Ageing Report, Ageing is defined in terms of chronological age with cut off age of 60 or 65 years. The global projection of geriatric population in 2025 more than 1.2 billion<sup>2</sup>. India geriatric population is increasing dramatically over next 4 decades. The share of population ages 60 and older is projected to climb 8% in 2010 to 19% in 2050 according to United Nation Population Division. Population ageing have major consequences and implications on all facets of human life like social, economic, physical. Balance impairment is the major cause of fall. Balance is the condition in which all the forces acting on the body are balanced such that the center of masses within the stability limits, the boundaries of the base of support<sup>3</sup>. Among all the physical and health deficits geriatrics are more

affected in balance. Fall is defined as inadvertently coming to rest on the ground or lower level with or without loss of consciousness of injury. Approximately, 30% people falled above 65 years. About three-fourths of the deaths from falls occur in people over 65 years.<sup>4</sup> Ageing process not only affect physical issues, mental issues are also play important role. The mental disorders that are frequently encountered in Indian elderly include dementia and mood disorders.<sup>5,6</sup> Cognition is the act or process of knowing, including awareness, reasoning, judgment, intuition, and memory. Age related declines in brain dopamine activity and periventricular white matter changes may be associated with reduced cognitive speed and basic motor functions. Attention is the important tool for cognition which describes that impairment of it, eventually affect ones overall performance, functional mobility<sup>6</sup> cognition is very complex, its many components it affects physical activity in many ways. Hence, cognition and physical mobility are intertwining<sup>7</sup>. So the

need of the study is to correlate between cognition and functional mobility.

### MATERIALS AND METHODS

Ethical clearance was obtained from Institutional Ethical Committee prior to the study. Subjects were taken from different old age homes and residential homes in Ahmedabad. A written consent was taken. On the basis of inclusion criteria subjects were taken in study. 81 Subjects both male and females were taken. Subjects were asked to fill MMSE scale (Gujarati) followed by timed up and go test. Timed up and go test (TUG) performed by subjects walked for 3m. Timed Up and Go test is used to assess balance, easily accessible and performed by elder population also. Subjects were asked to get up from chair walk with their own pace speed, take a turn and sit down on chair. Subjects walk with regular footwear & use any mobility aid but not assistance of another person. There is no time limit. Tasks should be performed twice and average of that would be counted as score.

### CRITERIA FOR SELECTION

Subjects (Both males and females) who were Age 60 years and above, willing to participate in the study. Subjects who were able to write and communicate in Gujarati language, able to walk with or without walking aid included in the study. People with history of vasomotor symptoms or giddiness, cardiovascular Disorders like Angioplasty, arterial disease, Systemic illness like renal disease, metabolic syndrome, underwent recent surgery ( 6-8 months), severe musculoskeletal disorder were excluded.

### STUDY CALCULATE SAMPLE SIZE

For calculation of sample size, MMSE scale was used and Timed Up and Go Test was performed. Hence, a pilot was done for Correlation between cognition and functional mobility in geriatric population. Formula used to calculate sample size.

$$\rho = 1 - \frac{6 \sum d^2}{n^3 - n}$$

$\rho$  is spearman correlation  
 $d$  = difference between both scale  
 $n$  = no. of sample size. Using value of spearman correlation sample size was calculated.

### RESULTS

N= 18  
 Mean= 26.2  
 Correlation value between TUG & MMSE  
 $r = -0.33$   
 After putting this digit in calculation for sample size, sample size is 81.

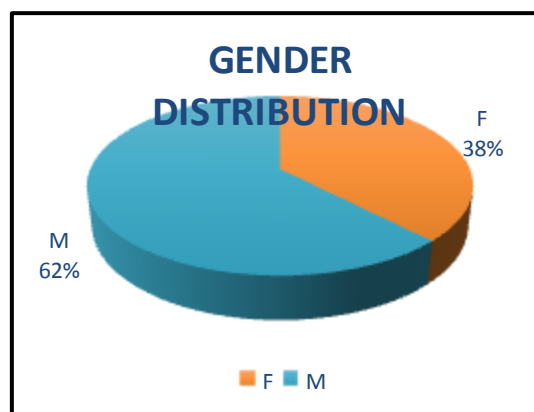
### STATISTICAL ANALYSIS

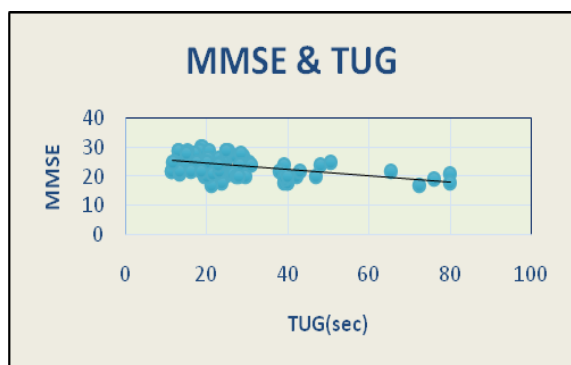
The result was analyzed using SPSS software version 24. For Normal distribution of the data Q-Q plots were used. But data was not normally distributed so non-parametric test was used. Microsoft excel used to generate graphs and table. Mean was calculated for Age and BMI. Spearman correlation test used to find correlation between outcome measures i.e. TUG and MMSE.

### RESULTS

Table 1. Mean of Age & BMI Fig 1 gender distribution

	AGE	BMI
MEAN	72.38±8.86	24.28±4.45





Graph 1 Scatter plot graph between TUG & MMSE

Table 2 Correlation between TUG & MMSE

TEST	N	r	p value
Spearman correlation	81	-0.455	p<0.05

Results of all statistical analysis were kept at significant level of  $p < 0.05$ . Table 1 shows mean Age and BMI. Figure 1 shows gender distribution which included 62% of males and 38% of females. Graph 1 showed scattered plot spearman correlation test, r value was -0.45 which indicate negative and moderate correlation.

## DISCUSSION

The main purpose of the study is to determine the correlation between Cognition and Functional Mobility in geriatric population. The scenarios of affecting old age peoples are increasing day by day. By viewing past literature correlation between these three factors are need to be strongly determined. Data was collected from old age home as well as residents of different societies of Ahmedabad. 81 subjects including both male and female are taken into the study. Age includes 60 years and above. Increasing in geriatric syndromes involving many components which affect the physical and psychological issues. Age wise distributions are affected older age group people rather than 60 yrs above. Deterioration in physiological and other neurocognitive functions make these populations excluding to a certain limit. The cofunctions between physical and mental issues are go parallel, degenerative process leads most common difficulty in mobility which gradually impact mental functions also or vice versa. Normal ageing leads to first affection in frontostriatal system which

causes loss in integrity, the memory circuits were affected, all the hormonal levels are decreased. All these functions happening together physiologically. Eventually it leads to behavioral memory measures and neurocognitive functions. Higher centers affection influence motor as well as other mental activities. By reviewed this points it make important to correlate 3 main important factors in geriatric population.

Despite of functional mobility, factors which can lead to prone to falls are many in geriatric population. In the present study the correlation between MMSE and TUG was -0.455,  $p < 0.05$ . Dhargave and Sendhilkumar<sup>8</sup> showed the reasons behind fear of falls. They formed high risk and low risk fallers. The cognition of high risk fallers were more affected as compared to low risk fallers. Subjects were taken from only Old Age Homes, only personal activity they had to perform. In present study subjects were taken from residential as well as from old age homes, in which social, recreational as well as personal factors considered. TUG is the most determinant tool to measured functional mobility in geriatrics. Herman et al<sup>12</sup> evaluate psychometric properties of TUG while compared with Berg Balance Scale and Gait Dynamic Index. Goodpster et al<sup>9</sup> strength and muscle mass affected with aging. This is explained well in Brauer et al<sup>10</sup> coactivation of agonist and antagonists group of lower limb muscles in balance impaired subjects were greater than non balance impaired Subjects. In the present study balance impaired was considered on the basis of TUG, >13 sec to complete task had affected balance.

Age related changes were Integrated into complex processes. One deficit not caused by one factor. Atrophy in gray Matter, sarcopenia, neuromuscular activity slowed the cognitive processes. Hall and Gillig<sup>11</sup> showed that cognitive training reduce the interacting time, decrease attention demands in dual task, where force platform was used.

Impaired balance leads to restrictions in daily activities as well as lead dependence on others. Current study showed for functional mobility easy access test which showed results but not as accurate as on force platform. Thus current study showed that there was correlation between functional mobility, cognition in geriatric population.

## CONCLUSION

The result of the study shows that there is a correlation between Cognition and Functional mobility among geriatrics between 60- 80 years. The correlation is negative, i.e. mobility decreases the cognitive function affection increases and vice versa. Hence study concludes that lack of mobility contributes mainly in degrading cognitive functions. Thus measures can be taken to involve geriatrics into physical activity.

## REFERENCES

1. Physiotherapy in Community Health and Rehabilitation. Waqar Naqvi.
2. India Aging Population, Population Reference Bureau, No. 25, march 2012
3. Physical Rehabilitation. Susan O' Sullivan
4. Motor Control: Theory and Practical Implications. Anne Shumway cook and Marjorie H. Woollacott
5. Summary of the Updated American Geriatric Society/British Geriatrics Society clinical Practice Guideline for Prevention of

- Falls in Older Persons, J Am Geriatr Soc59: 148-157,2011. (5)
6. Mane A. Elderly Care In India: Way Forward, J Gerontol Geriatr Res 5:339. doi10.4172/2167-7182
7. Deminitz N. et al. Associations between Mobility, Cognition, and Brain Structure in Healthy Older Adults, Front. Aging Neurosci. 9:155.
8. Pradnya D. Ragupathy Sendhilkumar. Prevalence of risk factors for falls among living in long-term care homes, Journal of Clinical Gerontology & Geriatrics,2016 (99-103)
9. Goodpster B. et al. The Loss of Skeletal muscle Strength, mass, and Quality in Older Adults; The Health, Aging and Body Composition Study, Journal of gerontology: medical Sciences, 2006, Vol61A 1059-1064.
10. Jennifer D. et al. Mobility predicts change in older adults' health-related quality of life: evidence from a Vancouver falls prevention prospective cohort study, BMC Geriatrics 2015 13:101
11. Hall C. and Gillig. Balance rehabilitation and dual-task ability in older adults, Journal Of Clinical Gerontology & Geriatrics 1(2010)22-26
12. Herman T. et al. Properties of the 'Timed Up and Go Test: More than Meets the Eye, Gerontology April 2011.

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