

# Relationship Between Activities of Daily Living and Cognitive Linguistic Ability in a Sample of Older Adults Living in Old Age Home

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**Abstract:** Aging is an inevitable irreversible process in all human population. With the aging process individuals become cognitively less agile and the effects of the decline is noted in their various abilities to do the Activities of Daily Living. This study was done to investigate the co-relation between the performance on cognitive linguistic tasks in CLAP-M test and Lawton instrumental activities of daily living scale in a sample of geriatric population, living in old age homes.

**Keywords:** Aging, Activities of Daily Living, Cognitive Linguistic Ability

## I. INTRODUCTION

Aging can be defined as an intrinsic, inevitable, and irreversible age-related process of viability and increase in vulnerability (Comfort, 1964). If aging impairs language production, it will disrupt interpersonal communication contributing to social disruption. (Ryan, See, Meneer & Trovato, 1994). The condition of elderly population living in the institution was that they felt lonelier, depressive and had a lower level of satisfaction with life (Aruna Dubey, 2011).

Sampath Kumar Lagishetti, & Lakshmi Venkatesh (2011) studied ‘Cognitive Linguistic Abilities in an Elderly Population’. CLAP-T was assessed. Results show age related effects were observed for all domains of cognitive linguistic skills among Telugu speaking adults & male participants performed better than female participants for total scores in the domains of auditory attention, memory and problem solving in Cognitive linguistic assessment.

Activities of daily living (ADLs), often termed physical ADLs or basic ADLs, include the fundamental skills typically needed to manage basic physical needs, comprised the following areas: grooming/personal hygiene, dressing, toileting/continence, transferring/ambulating, and eating. These functional skills are mastered early in life and are relatively more preserved in light of declined cognitive functioning when compared to higher level tasks. Basic ADLs are generally categorized separately from Instrumental Activities of Daily Living (IADLs), which include more complex activities related to independent living in the community (e.g., managing finances and medications). IADL performance is sensitive to early cognitive decline, whereas physical functioning is often a significant driver of basic ADL ability (Boyle, Cohen, Paul, Moser, & Gordon, 2002; Cahn-Weiner et al., 2007).

A study done by Bjork S, Juthberg C, Lindkvist M (2016) titled as ‘exploring the prevalence and variance of cognitive impairment, pain, neuropsychiatric symptoms and ADL dependency among persons living in nursing homes; a cross-sectional study’ aimed to investigate whether pain and neuropsychiatric symptoms differ in relation to gender, cognitive function, ADL-capacity, type of nursing home unit and length of stay among residents in a nationally representative sample of Swedish nursing home. The study used the seven-point MDS Activities of Daily Living Hierarchy scale [8] to measure ADL, where a score 2-4 indicates ADL assistance, and a score of  $\geq$  being dependent in ADL [3]. Results indicate that pain was more prevalent among residents with cognitive impairment and those who were ADL dependent.

## II. AIM

Aim of this study was to investigate the correlation between the performance on cognitive linguistic tasks and Lawton instrumental activities of daily living scale in geriatric population, living in old age homes.

## III. NEED OF THE STUDY

Geriatric population has been subjected to several studies focusing on language and cognitive deterioration. Even though there are studies done previously to assess language and cognitive skills in geriatric population with CLAP-M test material no studies are done on assessing the same along with a comparative assessment of Lawton instrumental activities of daily living scale in geriatric population staying in old age home.

## IV. METHOD

A total of 80 normal elderly persons living in the institution with the age range of 55 to 90 years who met all the study criteria were retained. Cognitive Linguistic Assessment protocol – Malayalam was administered for assessing the performance on cognitive and linguistic tasks and Lawton instrumental activities of daily living scale was administered to assess the activities in daily living, and it was administered in Malayalam and the scores of both Cognitive Linguistic Assessment Protocol - Malayalam and Lawton instrumental activities of daily living scale was compared. Cognitive linguistic aspects were assessed using Cognitive Linguistic Assessment Protocol containing four domains including attention (visual & auditory category), memory (episodic, working & semantic), problem solving (sentence disambiguation, sentence formulation, comparing and contrasting two objects, predicting the outcome of a described situation, predicting cause of a described situation, answering ‘why’ questions & sequential task analysis) and organization (categorization, analogies & sequencing of events).

## V. RESULTS AND DISCUSSION

Statistical Analysis was done using independent sample t-test using SPSS Software Version 22, and there was significant correlation between all domains of cognitive Linguistic Assessment Protocol- Malayalam (CLAP- M) and Lawton instrumental activities of daily living scale with p value less than or equal to 0.5 at 1% level of significance.

Table 1: shows the mean and SD of scores of CLAP-M and LIADS, and age of the subjects

	N	Minimum	Maximum	Mean	Std. Deviation
AGE	80	60	95	72.14	8.418
DOMAIN 1	80	19	60	42.40	11.005
DOMAIN 2	80	13	50	39.40	6.407
DOMAIN 3	80	8	30	22.55	5.189
DOMAIN 4	80	7	50	37.01	8.600
DOMAIN 5	80	0	50	21.69	12.701
DOMAIN 6	80	3	40	13.17	6.176
LIADL	80	10	31	23.24	4.753

**Domain 1: Attention, Discrimination and Perception**

In domain 1 of CLAP-M visual subtest and auditory subtest were assessed and the correlation between the scores of domain 1 of CLAP-M and the scores of LIADS was checked. There was a significant correlation between the scores of domain 1 of CLAP-M and scores of LIADS. The correlation between the domain 1 and LIADS was highly significant with p value 0.00 at 1% level of significance.

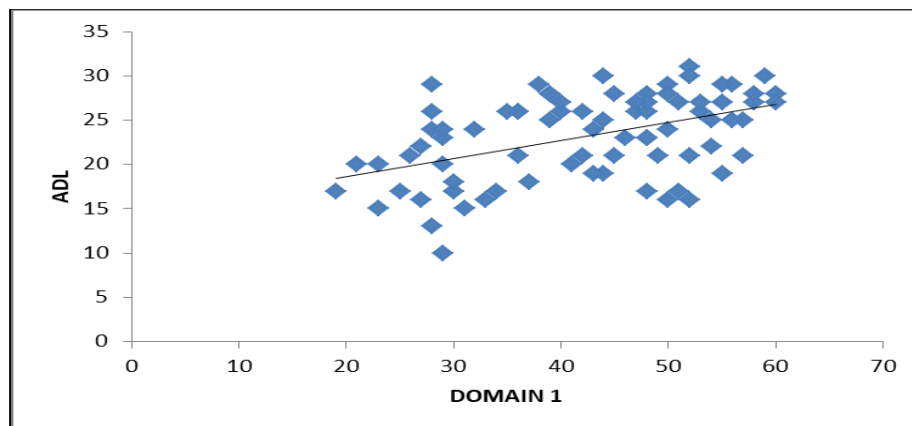


Fig.1 Graph showing the correlation between the scores of test material *Lawton instrumental activities of daily living scale* and domain 1 of CLAP-M

Based on correlation between scores of CLAP-M and LIADL was highly significant therefore it implies as age increases visual and auditory problems affects activities of daily living.

A study done by Freilich and Hyer, 2007 completed a factor analysis of the Repeatable Battery for the Assessment of Neuropsychological Status (RBANS) in relationship to ADL/IADL functioning. Poor performance on the Physical Self-Maintenance Scale correlated with impairment on the Attention and Immediate Memory Indices. With regard to specific ADLs, bathing impairment was associated with attention and total RBANS score. They suggested that attentional impairments that emerge later in the dementing process may be driving impairment in basic ADLs.

In a study done by Hall, Vo, Johnson, Barber, & O’Bryant, 2011 revealed that attention has been found to be an important predictor of overall ADL scores in patients with Alzheimer’s disease.

**Domain 2: Memory**

Episodic memory, working memory and semantic memory were assessed. Recent memory questions were asked under episodic memory. Working memory was assessed using digit backward and digit forward. Whereas in semantic memory, coordinate naming, super ordinate naming, word naming fluency, generative naming, sentence repetition, and carry out commands were the tasks given.

The correlation between the total score of domain 2 and scores of LIADS was found out in order to check whether any effect of memory deficit in the activities of daily living. And it was found that there is significant correlation between memory deficit and activities of daily living.

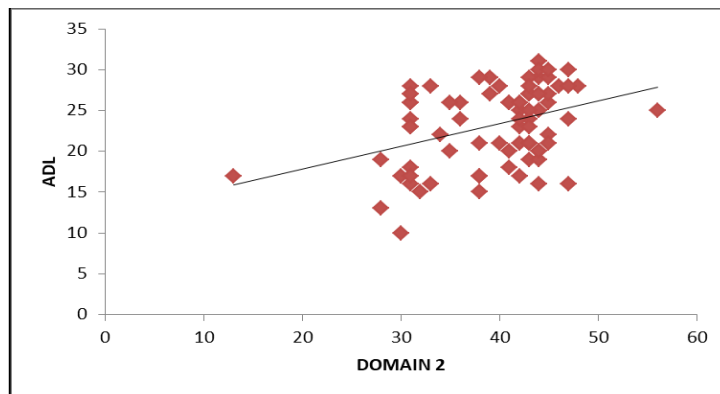


Fig.2 Graph showing the correlation between scores of test material *Lawton instrumental activities of daily living scale* and domain 2 of CLAP-M

The scores of domain 1 of CLAP-M and scores of LIADS was highly significant with the p value 0.000 at 1% level of significance. Based on the correlation between scores of LIADS and implies that memory deficits in the older individuals have greater impact on the daily living.

A study done by Jefferson and colleagues (2006) assessed patients with probable vascular dementia on cognitive functioning (using the DRS) and ADLs (instrumental and basic ADLs using informant-based measures) at baseline and 1 year later. Using logistic regression, they found that changes in memory scores (measured by the DRS Memory subscales) significantly predicted declines in basic ADLs. In another study, both immediate and delayed memory predicted deficits in dressing ability (Farias, Harrell, Neumann, & Houtz, 2002).

**Domain 3: Language**

Under domain 3 language was assessed. Verbal fluency, repetition and comprehension were assessed. The correlation between total score of LIADS and scores of domain 3 were assessed using Karl Pearson’s correlation. And there was a significant correlation between the 2 scores.

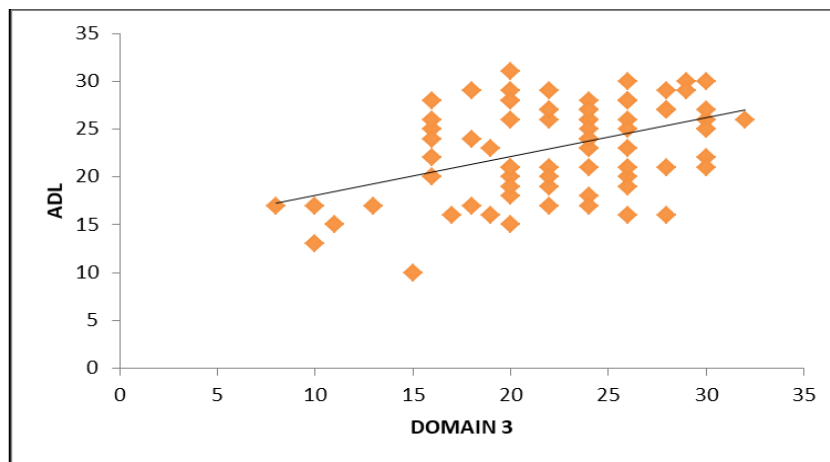


Fig.3 Graph showing the correlation between scores of test material *Lawton instrumental activities of daily living scale* and domain 3 of CLAP-M

The correlation between the scores of domain 3 and LIADS was highly significant with the p value 0.000 at 1% Of significance level. It implies that the language deficits in geriatrics have a significant impact on the activities of daily living.

#### Domain 4: Problem solving

Problem solving abilities were assessed the domain 4. Sentence formulation, compare and contrast, ‘WH’ questions, sentence disambiguation, predicting outcome and predicting cause were the tasks given under problem solving.

Correlation between the scores of domain 4 and sores of activities of daily living were checked using Karl Pearson’s correlation. The results show there a highly significant correlation between the 2 scores.

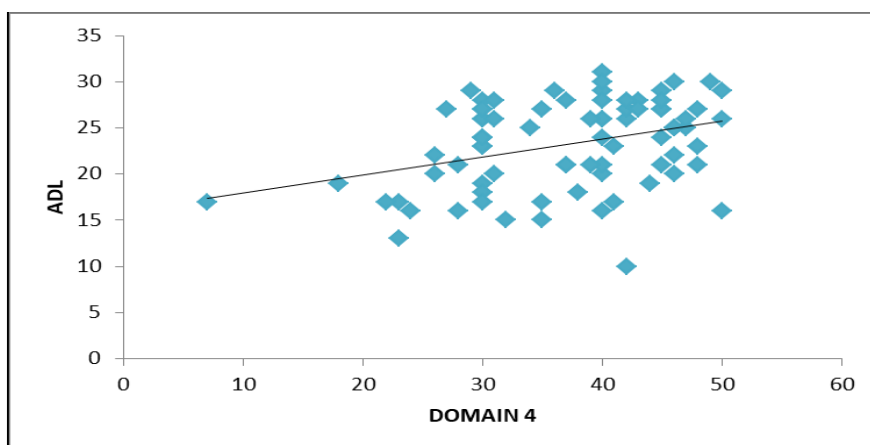


Fig.4 Graph showing the correlation between scores of test material *Lawton instrumental activities of daily living scale* and domain 4 of CLAP-M

The correlation between the 2 scores was highly significant with p value 0.001 at 1% level of significance. The results imply in geriatrics deficits in the problem solving also have a significant impact on the activities of daily living.

**Domain 5: Visuospatial skills**

Visuospatial skills were assessed in the domain 5. Clock drawing, copying and matching were the tasks that assessed under visuospatial skills and the correlation of scores of domain 5 and scores of LIADS were assessed using Karl Pearson’s correlation. There was a significant correlation between the scores of visuospatial skills and scores of LIADS.

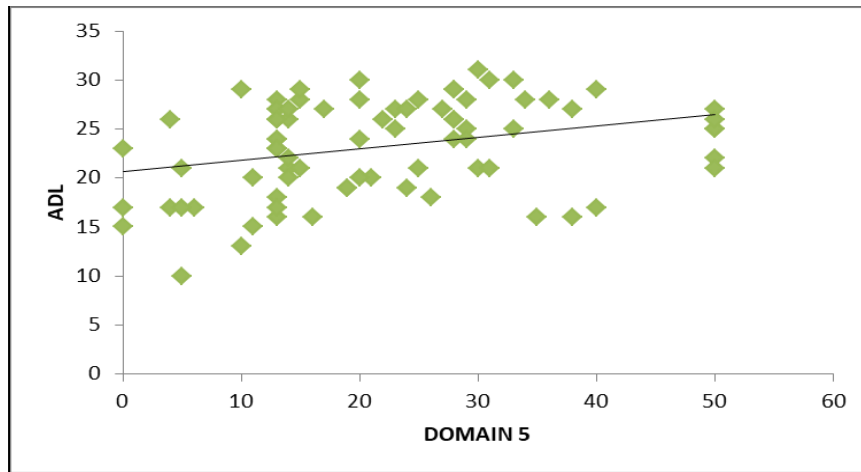


Fig.5 Graph showing the correlation between scores of test material *Lawton instrumental activities of daily living scale* and domain 5 of CLAP-M

There was a highly significant correlation between the activities of daily living and domain 5 with p value 0.005 at 1% level of significance. Results imply that deficits in solving problem skills have a greater impact on activities of daily living in geriatrics.

**Domain 6: Organization**

Organisation skills were assessed in the domain 6. Sequencing events, categorization and analogies were assessed under organisational skills. And the correlation between the total score of domain 6 and scores of LIADS were checked using Karl Pearson’s correlation. There was significant correlation between the 2 scores.

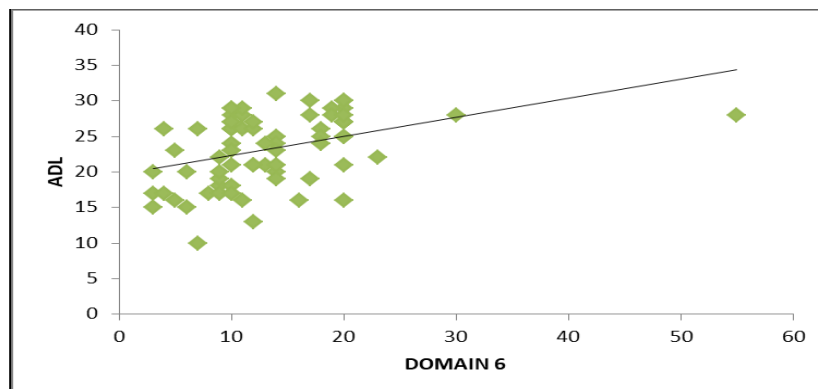


Fig.6 Graph showing the correlation between scores of test material *Lawton instrumental activities of daily living scale* and domain 6 of CLAP-M

There was a highly significant correlation between scores of domain 6 and scores of LIADS with p value 0.000 at 1% level of significance. Results show that deficits in the organisational skills have also had highly significant impact on the activities of daily living in geriatrics.

Table 2: shows the Karl Pearson’s correlation between domains of CLAP-M and LIADS

	Pearson Correlation	P	
DOMAIN 1	.475(**)	.000	HS
DOMAIN 2	.388(**)	.000	HS
DOMAIN 3	.447(**)	.000	HS
DOMAIN 4	.350(**)	.001	HS
DOMAIN 5	.312(**)	.005	HS
DOMAIN 6	.437(**)	.000	HS

There are several studies which support that there will be problems with activities of daily living due to the cognitive and linguistic deficits. There are so many age-related deficits that’s seen in elderly population and these deficits may lead to deterioration of cognitive and linguistic abilities, and it results in problems with everyday activities.

A study done by Njegovan, Man-Son-Hing, Mitchell, and Molnar, 2001 revealed that IADLs were lost at higher levels of cognitive functioning compared to ADLs although some overlap existed. Among the ADL categories measured, participants on average lost the ability to bathe independently before losing their ability dress, use the toilet, and transfer. Ability to groom and eat independently were the most well-preserved ADL tasks as cognition declined.

**VI. CONCLUSION**

Based on the results obtained by administering Cognitive Linguistic Assessment Protocol- Malayalam and Lawton Instrumental Activities of Daily living we can conclude the activities of daily living are affected in geriatric population. The relationship between scores of Cognitive Linguistic Assessment Protocol and Lawton instrumental activities of daily living leads to a conclusion that all the domains of cognitive Linguistic Assessment Protocol such as attention, memory, problem solving and organisation skills are perfectly correlating with Lawton Instrumental Activities of Daily Living. It reveals that there is a significant effect on activities of daily Living. It reveals that there is a significant effect on activities of daily living of geriatric population which is correlating with Cognitive Linguistic Assessment Protocol (Malayalam) scores.

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