



A COMPARITIVE STUDY OF CORRELATION BETWEEN INDEPENDENCE IN ACTIVITIES OF DAILY LIVING AND COMMUNITY INTEGRATION IN HEALTHY ELDERLY ADULTS AND PEOPLE WITH MILD COGNITIVE IMPAIRMENT OF SAME AGE GROUP

Occupational Therapy

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ABSTRACT

Background: Mild cognitive impairment (MCI) has been conceptualized as a prodromal state of a neurodegenerative disorder such as Alzheimer's disease and an intermediate state between normality and mild dementia and it is distinguished from mild dementia by the absence of global intellectual deterioration and significant deficits in Activities of daily living (ADL)[1] In the elderly, even in healthy ones, slowing of arithmetical functions is found, which is often clinically hard to distinguish from that produced by neurological deterioration.[2,3]Slowing of numerical skills with age may have many causes, not just degenerative diseases and evaluating this deterioration will be preliminary to effective retraining.[3]

Methodology: A sample of 98 elderly adults fulfilling the inclusion criteria were enrolled in this study. The screening tool used was Montreal Cognitive Assessment (MOCA). All the elderly populations were assessed using the four scales i.e. Functional Independence Measure (FIM), Lawton's Instrumental Activities of Daily living (IADL), Numerical Activities of Daily Living (NADL) And Community Integration Questionnaire (CIQ). All this scales were analyzed using spearman formula. Comparison and correlation was done of all the scales amongst each other. **Result:** Those who score 18-25on MOCA were grouped into Group A(MCI) & those who scored 26 and above were put into Group B(Healthy elderly).The results and findings of the present study concluded that on comparison, the scores of ADL, IADL, NADL and CIQ was significantly higher in Group B than that of Group A. **Conclusion-** In Group A, we found a strong positive correlation between IADL & NADL and IADL & CIQ, which states that subjects who score good in numerical activities are independent in IADL, integrate well in community, while in Group B, a moderate positive correlation was found between the scales of IADL & CIQ, which means that subjects who were independent in IADL integrated well in community

KEYWORDS

Numerical activity of Daily living, Mild cognitive impairment, Elderly population, Community Integration

INTRODUCTION

Number processing and calculation are an essential part of our culture. We use numbers for counting, measuring, comparing, putting things in order, etc. [2] We constantly need to calculate, understand fractions, proportions and ratios, and to understand and remember PIN codes, telephone numbers, addresses, shoe sizes, and so on[2]. NADL is a battery designed to assess the patient's performance in everyday activities involving numbers. India ageing report 2017 stated that by 2030, India will have around 17.8 million elderly people with difficulty in accomplishing ADLs.[5] Older adults have an increased risk of social isolation and loneliness stemming from events such as transitioning into retirement. The risks are also linked to poor sleep quality, increased blood pressure, impaired cognitive function and depression. Social integration of older adults via community participation has been demonstrated to improve quality of life (QoL) [4]. There is a need to understand the activity limitations which occur in mild cognitively impaired elderly adults, thus there is need to assess different types of ADL. It is necessary to identify the CI amongst the elderly population as older adults are at the higher risk of being socially isolated due to loss of partner/spouse, friends and relatives/neighbors. There is a need to explore the factors associated with community participation for older adults, to inform interventions which can maximize QoL and wellbeing. [5] In the elderly, even in healthy ones, slowing of arithmetical functions is found, which is often clinically hard to distinguish from that produced by neurological deterioration [2,3]

Rationale Of The Study

In clinical practice, a few measures of Activities of Daily Living are available in which numerical abilities are not distinguished from other abilities and thus no instrument was available so far to measure the nature and the extent of damage to everyday life until Numerical activity of daily living(NADL) was published in 2014.No studies are done using NADL in elderly patients and this tool has not been used on Indian population .It is necessary to find out if activities of daily living hamper the Community integration in healthy elderly as well as mild cognitive patients and by finding the correlation will help us to intervene the elderly population in better ways.

Aims And Objectives

Aim- To study correlation between Independence in ADL and CI in healthy elderly adults and people with MCI of same age group

Objectives –

1. To measure and compare ADL,IADL ,NADL and CI in healthy elderly adults and MCI

2. To correlate between ADL and CI in MCI and healthy elderly adults.

Hypothesis

Hypothesis 1

Alternative Hypothesis (H₁):

There is significant correlation between ADL, IADL, NADL and Community integration in MCI

Null Hypothesis (H₀):

There is no significant correlation between ADL, IADL, NADL and Community integration in MCI.

Hypothesis 2

Alternative Hypothesis (H₂):

There is a significant correlation between ADL, IADL&NADL and Community integration in healthy elderly adults.

Null Hypothesis (H₀):

There is no significant correlation between ADL, IADL, NADL & Community integration in healthy elderly adults

MATERIALS & METHODS

- **Design:** Cross-Sectional study and comparative study, conducted in Mumbai for a periods of 1 year and convenient sampling method was used.
- **Sample Size:** 98

Inclusion criteria	Exclusion criteria
Gender -male and female	Patients diagnosed with any other Neurological or psychiatric problem. Patient with visual, auditory, speech impairment.
Age - 61-75 years	
MOCA score - 18-25 under MCI and above 26 in healthy elderly group	

Screening tool used was MoCA is screening assessment for detecting cognitive impairment.

MoCA scores range between 0 and 30.A score of 26 or over is considered to be normal 18-25 will be considered as MCI

Scales Used:

FIM assesses physical and cognitive disability where each item is

scored from 1 to 7 based on level of independence. Lawton IADL measures 8 domains of function likely food preparation, housekeeping, laundering, money management, etc. NADL is divided into four parts -The Patient Interview, the Caregiver Interview, The Informal Test, The Formal Test which is a detailed assessment of the numerical abilities critical to daily living; these abilities are typically assessed in neuropsychological investigation of numerical and mathematical impairments. CIQ contains 15 items assessing community integrations across three domains: -Home integration, Social integration, Productive activity.

Methodology

- The study commenced after receiving approval from the institutional ethics committee.
- Patients fulfilled the inclusion criteria from an Urban Health Care Centre attached to a tertiary care hospital, were also included in the study.
- An Informed consent was taken from each person participating in the study in consensus and in the language best understood by them.
- Cognition was assessed in the elderly using MOCA tool. Those who score 18-25 were grouped into Group A & those who scored 26 and above were put into Group B. The sample size was 98 out of which in healthy elderly group the total number was 57(Group A) and MCI the total number was 41(Group B).
- Then all the elderly populations from both the groups were assessed using the four scales and comparison and correlation between all the scales were done in both the groups i.e. healthy and MCI group was done.
- All this scales were analyzed using spearman formula.

RESULTS AND TABLES

Statistical Procedures:

Descriptive statistics like Mean and SD for numerical data has been depicted Intra group comparison was done using paired t test.

For all the statistical test , $p < 0.05$ was considered to be statistically significant, keeping α error at 5% and β error at 20%, thus giving a power to the study as 80% * = statistically significant difference ($p < 0.05$)

COMPARISON TABLE	Group A (MCI)		GROUP B (Healthy)	
Sample size (98)	41		57	
Gender (female/male)	F-40	M-1	F- 35	M-22
Mean age (60-75)	67		69	
Mean MOCA score	21.5		28.09	
Mean FIM score	122		126	
Mean IADL score	7		7.41	
Mean NADL score	92.61		103.8	
Mean CIQ score	18.44		23.82	

TABLE 1 -Comparison of statistics between Group A and Group B

COMMUNITY INTEGRATION	MCI (GROUP A)	Healthy(GROUP B)
1. FIM(BADL)	WEAK POSITIVE (0.22)	WEAK POSITIVE(0.27)
2. IADL	STRONG POSITIVE (0.62)	MODERATE POSITIVE(0.42)
3. NADL	MODERATE POSITIVE (0.49)	WEAK POSITIVE (0.27)

TABLE 2 -Correlation between Community Integration and all types of ADL in Group A and Group B

$r = 0.20-0.39$ weak positive correlation
 $r = 0.40-0.59$ moderate positive correlation
 $r = 0.60-0.79$ strong positive correlation

DISCUSSION

The present study was conducted to find out correlation between different activities of daily living like ADL, IADL, NADL and Community Integration in healthy elderly and MCI elderly adult and to

evaluate the difference in functional limitations in ADLs and CI in these adults.

Correlation between NADL & IADL which indicated a strong positive correlation in Group A and moderate positive correlation in Group B. Elderly adults who were independent in IADLs scored well in NADL too which indicates that IADL and NADL have a positive strong correlation.

Correlation between IADL & CIQ which indicate Strong positive correlation in Group A and moderate positive correlation in Group B. The adults who were independent in instrumental activities of daily living integrated and participated well in community.

Correlation between NADL & CIQ which indicate moderate positive association in Group A and weak positive correlation in Group B. The adults who scored less in numerical abilities participated less in community integration. The Elderly adults who can function independently at home, perform their own activities had multiple barriers for community integration. The family background, location ,accessibility were few of the reasons .There was availability of care giver and helper in the joint families which helped them to do outdoor chores ,bringing medications, do shopping for them etc. There was less accessibility of medical shops, medical care clinics, recreational activities like yoga centers, worshipping places like temple and church. The location of these places was too crowded for the elderly adult to travel. Longer distances also prevented them to get out of their home. Fatigue and pain was the another reason which lead to their decreased community participation

CONCLUSION

The results and findings of the present study concluded that on comparing, the scores of ADL, IADL, NADL and CI was significantly higher in Group B than that of Group A.

Concluding about Group A, we found a strong positive correlation between IADL & NADL and IADL & CI, while a Moderate positive correlation was found in NADL & CI.

When correlating between scales in Group B which consisted of healthy elderly adults, a weak positive correlation was found between the scales of NADL & CI while a moderate positive correlation was found between the scales of IADL & CI and IADL & NADL.

This study can be used as a baseline for any treatment modality for geriatric patients with mild cognitive impairment to improve their community integration and thus social participation.

Limitations Of The Study

The study was conducted on a small sample size. The study population was taken from an urban health care center attached to the hospital, thus getting more number of females than males.

Further Recommendations

The study can also be conducted among the patients with different socio economic strata. A specific screening on executive functioning can be included in a further study. Interventional based study to improve the numerical skills to improve IADLs and community integration can be conducted. A multi centric study can be conducted involving other suburbs as well

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