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A Study To Evaluate The Effectiveness Of Cognitive Exercises In Improving Cognitive Abilities Of Elderly With Dementia In Selected Old Age Home, Namakkal

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ABSTRACT

A normal aspect of ageing is the potential for cognitive ability to deteriorate somewhat as people get older. On the other, minor cognitive impairment or even dementia or a significant neurocognitive illness may develop if this cognitive decline worsens. A common problem among people over 60 is cognitive deterioration. It is anticipated that India's old population would triple to two billion people. The aim of this study is to evaluate the effectiveness of cognitive exercises in improving cognitive functions & to find out the association between post-test level of cognitive functions with their selected Demographic variables among the elderly with dementia in a selected old age home in Namakkal. A quasi-experimental pretest and post-test design was adopted for this study. A total of 40 elderly with dementia were selected using purposive sampling technique from a selected old-age home, Namakkal & those who fulfilled the inclusion criteria. Cognitive functions were assessed using a standardized tool Mini-Mental Status Examination (MMSE). Cognitive exercises, including memory tasks, puzzles & attention-based activities were administered. The data were analyzed using descriptive & inferential statistics. The average score for cognitive functions in older adults with dementia was 21.65 with 34.36% prior to the intervention, & it is 18.22 with 28.92% mean percentage after the intervention. Elderly with dementia had pretest median & SD scores of 21 & 4.67 for cognitive functions, and post-test median and SD scores of 18 & 4.02. For cognitive function, the t-test value is 7.07. At the 0.05 level of significance, the computed value of 7.07 is greater than the tabulated value of 1.96 at 39 df. It indicates that cognitive exercises are useful in enhancing the cognitive functions among elderly with dementia. The chi-square analysis was used to find the association between the post test level of cognitive functions among elderly with their selected demographic variables. It shows that the calculated value is greater than the table value in occupation before entering the old-age home and length of stay are significantly associated with their selected demographic variables.

Keywords : *Cognitive exercises, cognitive function, elderly, old age home, cognitive decline, non-pharmacological intervention, Namakkal*

1. INTRODUCTION

Aging is a natural process that brings about physiological, psychological and cognitive changes. One of the significant concerns in aging populations is cognitive decline, which may manifest as reduced memory, attention, problem-solving abilities and other executive functions. Cognitive decline, when not addressed, can severely affect the quality of life and independence of the elderly, leading to social isolation, depression, increased dependency. In India, the prevalence of cognitive impairments among older adults is increasing due to lifestyle changes, limited mental stimulation, and the absence of supportive interventions.

Cognitive exercises are structured activities designed to stimulate the brain and enhance various cognitive domains such as

memory, attention, language and executive functions. Research has shown that cognitive exercises can delay or slowdown cognitive decline, thereby improving the mental well-being and functional independence of elderly individuals. Cognitive stimulation techniques, including puzzles, memory games, problem-solving tasks and attention-focused activities, can potentially reverse mild cognitive impairments and enhance the quality-of-life elderly individuals.

Old age homes provide care and support for senior citizens, but opportunities for mental stimulation may sometimes be limited. This lack of cognitive engagement can accelerate the decline of cognitive functions. Thus, it becomes essential to explore effective interventions that promote cognitive health among the elderly residing in these institutions.

2. OBJECTIVES

To assess the level of cognitive functions among elderly with dementia before implementing the cognitive exercises at selected old age home, Namakkal

To assess the effectiveness of cognitive exercises on cognitive functions among elderly with dementia after implementing the cognitive exercises at selected old age home, Namakkal

To compare the pretest and post-test level of cognitive functions among elderly with dementia at selected old age home, Namakkal

To find out the association between post-test level of cognitive functions among elderly with dementia with their selected Demographic variables such as age, sex, religion, marital status, education, occupation, source of income duration of hospital stay.

Hypothesis

H_0: There is no significant difference between pretest and post-test level of cognitive functions among elderly with dementia at selected old age home.

H_1: There is a significant improvement in cognitive functions among elderly with dementia after implementing the cognitive exercises.

3. METHODOLOGY:

A quasi-experimental pretest and post-test design was adopted for the study. A total of 40 elderly with dementia were selected using purposive sampling technique from a selected old age home, Namakkal. Pretest scores were recorded before the intervention, and post-test scores were obtained after the intervention to measure changes in cognitive function.

Table 1: Frequency and Percentage distribution of demographic variables of subjects (n=40)

S.No	Demographic data	Frequency	Percentage (%)
1	Age (years)		
	60 – 65	10	25
	66 – 70	22	55
	71 – 75	8	20
2	Gender		
	Male	26	65
	Female	14	35
3	Marital status		
	Unmarried	-	-
	Married	19	47.5
	Divorced	6	15
	Widowed	15	37.5
4	Religion		

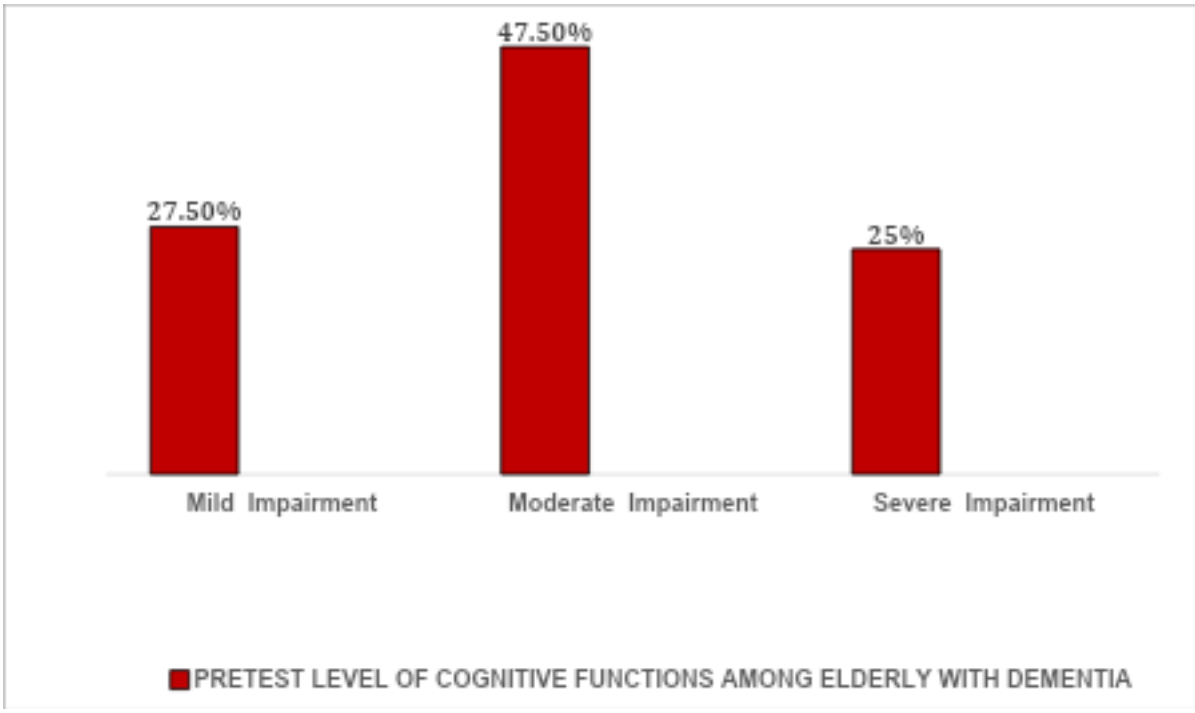
	Hindu	26	65
	Christian	7	17.5
	Muslim	3	7.5
	Others	4	10
5	Educational status		
	Illiterate	7	17.5
	Primary	13	32.5
	Secondary & Senior secondary	15	37.5
	Graduate & Post Graduate	5	12.5
4	Occupation before coming to old age home		
	Government	3	7.5
	Self employed	1	2.5
	Private	27	67.5
	Others	9	22.5
5	Present source of income		
	Pensioner	6	15
	Receiving from children	23	57.5
	Other resources	7	17.5
	None	4	10
6	Duration of stay in old age home		
	< 1 year	7	17.5
	2 – 3 years	23	57.5
	3 – 5 years	6	15
	5 years and above	4	10

Table 1 shows that majority of patients were 22 (55%) in the age group of 66-70 years, and 26 (65%) were male. The majority of the elderly 27 (67.5%) were private workers before coming to old age home and most of the 27 (57.5%) were receiving financial support from their children monthly.

Table 2: Frequency and percentage distribution of pretest level of cognitive function among elderly with dementia (n=40)

PRE-TEST LEVEL OF COGNITIVE FUNCTION	**PRE-TEST**	
	FREQUENCY (N)	**PERCENTAGE (%)**
Mild Impairment	**11**	**27.5**
Moderate Impairment	**19**	**47.5**
Severe Impairment	**10**	**25**
Total	**40**	**100**

Table 2 represents the pretest level of cognitive functions among elderly with dementia before implementing the cognitive exercises. It shows that 11(27.5%) had mild impairment 19(47.5%) had moderate impairment and 10(25%) had severe impairment in their cognitive functions.



POST-TEST:

Table 2: Post-test level of cognitive function among the elderly with dementia:

Table 2 represents the post-test level of cognitive functions among elderly with dementia after implementing the cognitive exercises. It shows that 22(55%) had mild impairment 16(40%) had moderate impairment and 2(5%) had severe impairment in their cognitive functions.

POST-TEST LEVEL OF COGNITIVE FUNCTIONS	POST-TEST	
	FREQUENCY (N)	PERCENTAGE (%)
Mild Impairment	22	55
Moderate Impairment	16	40
Severe Impairment	2	5
Total	40	100

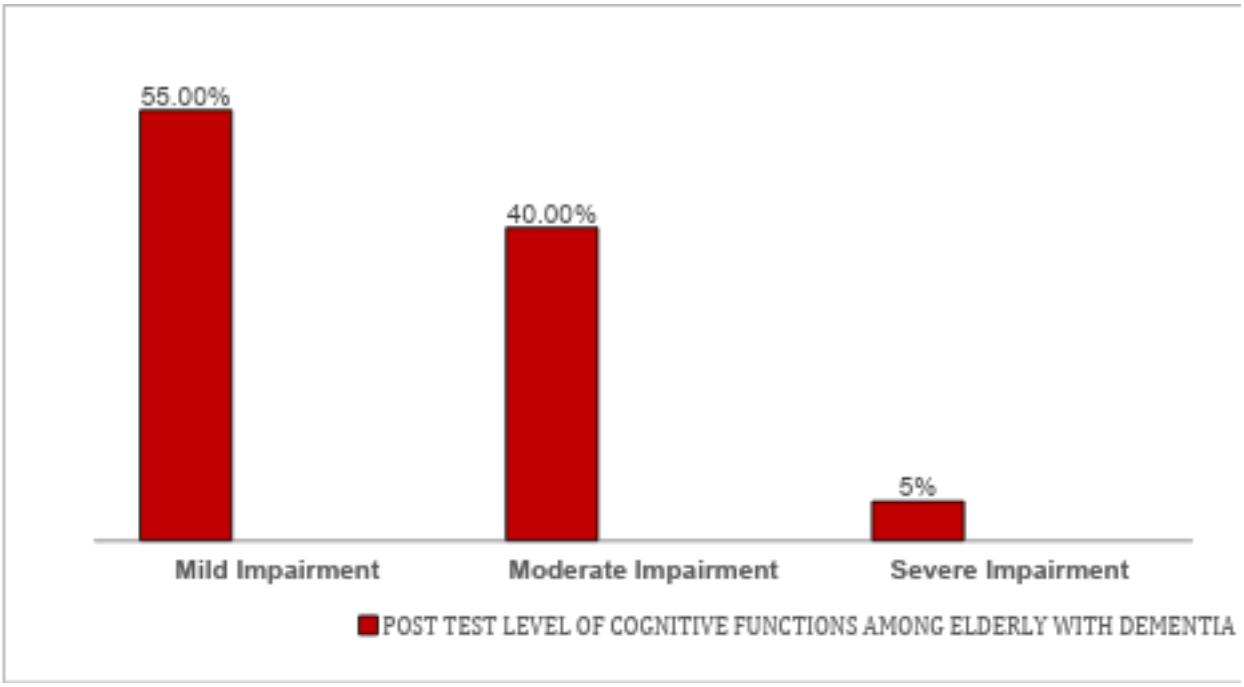
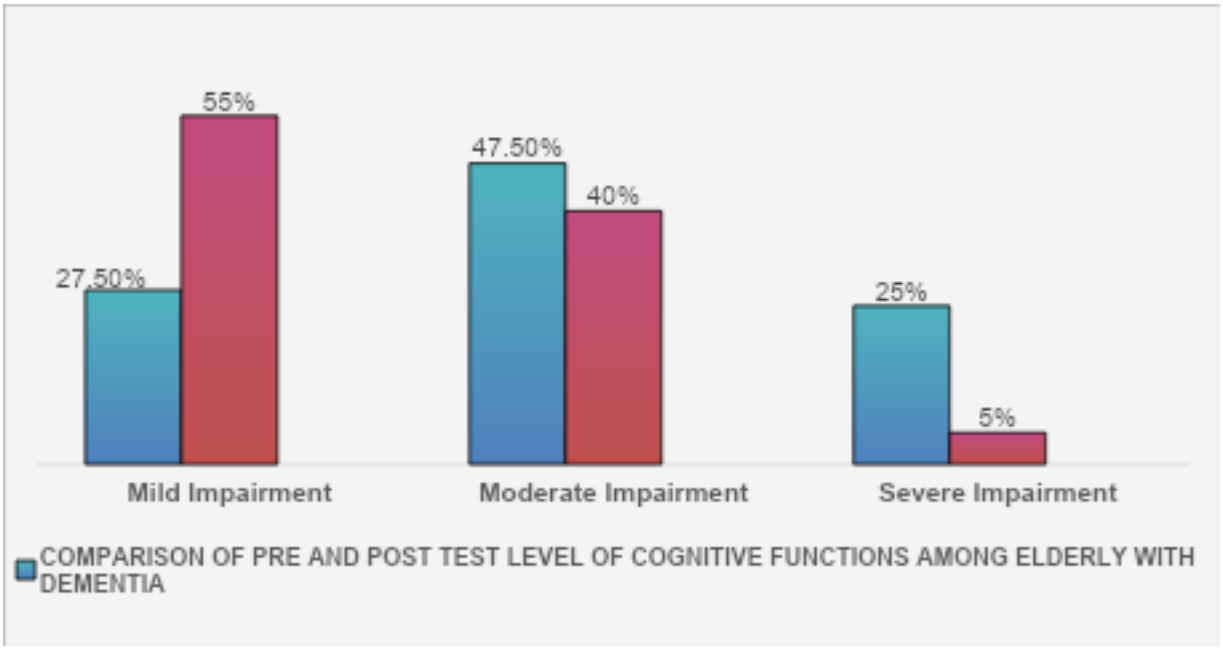


Table 3: Comparison of pretest and post-test level of cognitive functions among elderly with dementia

S.No	Aspect	Mean	Mean Percentage	Median	Mean Difference	Standard Deviation	CV
1	Pre test	21.65	34.36	21	3.43	4.67	7.07
2	Post test	18.22	28.92	18		4.02	



The mean score of cognitive functions of elderly with dementia 21.65 with 34.36% before intervention while post-test mean

score of cognitive functions of elderly with dementia is 18.22 with 28.92% mean percentage. The pretest median and SD of cognitive functions of elderly with dementia is 21 and 4.67 while the post-test median and SD is 18 and 4.02. The t test value for cognitive function is 7.07. The calculated value i.e. 7.07 is more than tabulated value i.e. 1.96 at 39 df on 0.05 level of significance. It means cognitive exercises are effective in improving the cognitive functions among elderly with dementia.

Table 4: Association of post test level of cognitive functions among elderly with dementia with their Selected Demographic Variables

S.NO	DEMOGRAPHIC VARIABLES		FREQUENCY	MILD		MODERATE		SEVERE		X^2
	VARIABLES	CATEGORY		NO	%	NO	%	NO	%	
1	Age (years)	60 – 65	10	6	15	4	10	0	0	1.508
		66 – 70	22	12	30	9	22.5	1	2.5	
		71 – 75	8	4	10	3	7.5	1	2.5	
2	Gender	Male	26	16	40	8	20	2	5	3.236
		Female	14	6	15	8	20	0	0	
3	Marital status	Unmarried	0	0	0	0	0	0	0	10.172
		Married	19	13	32.5	6	15	0	0	
		Divorced	6	3	7.5	2	5	1	2.5	
		Widowed	15	6	15	8	20	1	2.5	
4	Religion	Hindu	26	16	40	10	25	0	0	9.841
		Christian	7	4	10	2	5	1	2.5	
		Muslim	3	2	5	1	2.5	0	0	
		Others	4	0	0	3	7.5	1	2.5	
5	Educational status	Illiterate	7	4	10	2	5	1	2.5	4.564
		Primary	13	7	17.5	5	12.5	1	2.5	
		Secondary & Senior secondary	15	7	17.5	8	20	0	0	
		Graduate & Post Graduate	5	4	10	1	2.5	0	0	
6	Occupation before coming to	Government	3	1	2.5	2	5	0	0	13.434*
		Self employed	1	0	0	1	2.5	0	0	

	old age home	Private	27	20	50	6	15	1	2.5	
		Others	9	1	2.5	7	17.5	1	2.5	
7	Present source of income	Pensioner	6	4	10	2	5	0	0	11.254
		Receiving from children	23	15	37.5	7	17.5	1	2.5	
		Other resources	7	1	2.5	6	15	0	0	
		None	4	2	5	1	2.5	1	2.5	
8	Duration of stay in old age home	< 1 year	7	4	10	3	7.5	0	0	21.072*
		2 – 3 years	23	15	37.5	8	20	0	0	
		3 – 5 years	6	2	5	4	10	0	0	
		>5years	4	1	2.5	1	2.5	2	5	

Table 3 presents substantive summary of chi-square analysis which was used to bring out the association between the post-test level of cognitive functions among elderly with dementia with their selected socio-demographic variables. The analysis reveals that there is a significant level of association between occupation before entering the old-age home (X^2= 13.434, $p<0.05$ X^2=13.434) and duration of stay (X^2=21.072, $p<0.05X^2$=21.072) with their selected demographic variables since the calculated value is higher than the table value.

4. RESULTS

The data were analyzed using descriptive and inferential statistics.. The findings showed a statistically significant improvement in the post-test cognitive function scores compared to the pretest scores ($p < 0.05$). Key improvements were observed in areas such as memory, attention, and problem-solving abilities, indicating the positive impact of the cognitive exercise intervention and there was a significant association between the post level of cognitive functions among elderly with dementia with their selected socio-demographic variables (occupation before coming to old age home and duration of stay in old-age home).

5. DISCUSSION

Objective 1: To assess the level of cognitive functions among elderly with dementia before implementing the cognitive exercises at selected old age home, Namakkal

The level of cognitive functions was assessed by using Mini Mental Status Examination. Out of 40 patients 11 (27.5%) had mild impairment, 19 (45%) had moderate impairment and 10 (25%) had severe impairment in their cognitive functions. This study was supported by Sujitha P et.al., (2022) conducted a cross sectional study on assessment of cognitive impairment and behavioural risk factors among senior citizens living in old age homes in Chengalpattu district, Tamilnadu. Among 330 senior citizens living in old age homes by using a two-stage multistage sampling method. A standardized pretested structured questionnaire containing Brief Interview for Mental Status (BIMS) scale was used. Data was analysed using SPSS. Results revealed that 44% had mild to moderate cognitive impairment and 36% had severe cognitive impairment.

Objective 2: To assess the effectiveness of cognitive exercises on cognitive functions among elderly with dementia after implementing the cognitive exercises at selected old age home, Namakkal.

The level of cognitive functions among elderly with dementia after implementing the cognitive exercises are 22 (55%) had mild impairment, 16 (40%) had moderate impairment and 2(5%) had severe impairment in their cognitive functions. This study was supported by Miriam Sanjuan et.al.,(2020) conducted a review study on effectiveness of cognitive interventions in older adults. The aim of the study was to analyze the available evidence concerning the effect of cognitive interventions for improving or maintaining the general cognitive status of older adults who present different cognitive levels. A review of studies published between 2010 & 2019 using the following data bases: PubMed, PsycINFO, Cochrane, Google Scholar, ProQuest and Medline. From the selected 13 systematic reviews and/or meta analyses, Cognitive interventions have proven effective for maintaining and/or improving cognitive functioning in older adults regardless of their initial cognitive status.

Objective 3: To compare the pretest and post-test level of cognitive functions among elderly with dementia at selected old age home, Namakkal

The mean score of cognitive functions of elderly with dementia 21.65 with 34.36% before intervention while post-test mean score of cognitive functions of elderly with dementia is 18.22 with 28.92% mean percentage. The pretest median and SD of cognitive functions of elderly with dementia is 21 and 4.67 while the post-test median and SD is 18 and 4.02. The t test value for cognitive function is 7.07. The calculated value i.e. 7.07 is more than tabulated value i.e. 1.96 at 39 df on 0.05 level of significance. It means cognitive exercises are effective in improving the cognitive functions among elderly with dementia.

Objective 4: To findout the association between post test level of cognitive functions among elderly with their selected demographic variables such as age, sex, religion, marital status, education, occupation, source of income and duration of hospital stay.

It shows that calculated value is greater than the table value in occupation before entering the old-age home and length of stay are significantly associated with their selected demographic variables. This study was supported by Kamaran Yazdanbakhsh et.al., (2023) conducted a quasi experimental study on assessing the effectiveness of cognitive rehabilitation on improving the cognitive abilities of the elderly. They selected 24 samples using convenient sampling technique on elderly those who residing in nursing homes Kermanshah city. After the interventions the results revealed that the selected demographic variables were significant at the level of 0.05 and 0.01.

6. CONCLUSION

The study concludes that cognitive exercises are effective in enhancing cognitive functions among the elderly. Incorporating such exercises into the daily routine of elderly care can promote cognitive well-being, improve independence, and enhance the quality of life. These findings highlight the importance of non-pharmacological interventions in geriatric care, particularly in institutional settings like old age homes. This result revealed that there was a significant relationship between the post test level of cognitive functions among elderly with dementia with their selected socio-demographic variables of occupation before coming to old age home and duration of stay in old-age home. Further research with a larger sample size and long-term follow-up is recommended to validate these results.

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