

THE EFFICACY OF STRUCTURED COGNITIVE STIMULATION ON COGNITIVE FUNCTIONING AMONG MIDDLE AGED WOMEN HAVING EARLY SYMPTOMS OF DEMENTIA IN SELECTED AREAS OF JAMMU

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ABSTRACT

The stressful life of women is gaining more attention and has come into limelight as a prominent cause of dementia. Dementia is a concern for many women. The women in menopausal transition also seem to be most fearful of developing breast cancer, closely followed by Alzheimer's dementia. Dementia is one of the leading problem faced by the people worldwide now a days and a matter of worry too.

Understanding Mild cognitive impairment (MCI) is important, and many cases may progress to dementia, though some may revert to normal cognition. Very few studies on MCI have been carried out in India. The prevalence is estimated to reach 3.6 million by 2020 and 7.5 million by 2040 in this region. The main study was conducted on 200 subjects. The statistical paired 't' test implies that the difference in the pre test and post test mean MMSE score in experimental group found to be statistically significant at 5% level ($p < 0.05$) with paired 't' value of 38.96, there exists a statistical significance in the post MMSE score revealed a positive impact of structured cognitive stimulation.

Altogether the results expounded that there is an enhancement of scores in MMSE indicating the effectiveness of structured cognitive stimulation.

INTRODUCTION

Dementia is a progressive neurodegenerative disease characterized by global cognitive decline. Memory loss is usually the initial symptom, including deficits in both short-term and long-term memory. Later, higher cognitive functions including language and executive functioning become impaired, often accompanied by behavioral disturbances, personality changes and loss of ability to function^{1,2}. Early detection of Mild cognitive impairment is very important because cognitive decline can be potentially arrested or reversed by therapeutic intervention. However, especially in Asia, there are few researches which focus on screening for Mild cognitive impairment and early Alzheimer Disease^{3,4}.

Current clinical and epidemiological studies have emphasized the role of stress as an important risk factor for physical and mental disorders that capture the causes of morbidity and mortality particularly in developed societies and recently in developing countries. Psychological health indicators are important for monitoring and evaluating the health status of communities⁴. The exposure to cognitive stimulation sessions can ensure dramatic client empowerment irrespective of age, gender, literacy and language skills. In a prospective study the clients exposed to cognitive sessions substantiate a greater awareness about early symptoms of dementia⁵.

The objectives of the study were to determine the prevalence of early symptoms of dementia among women having early symptoms of dementia in selected areas of Jammu; determine the relationship between cognitive function score and stress score before intervention; assess and compare the cognitive function score; determine the association between levels of cognitive functions and the demographic variables; explore the opinion of women.

MATERIALS AND METHODS

The research design selected for the study was true experimental design. Conducted pre test simultaneously on both experimental and control group, and self instructional module on Structured Cognitive Stimulation was administered to experimental group subjects and then conducted post test simultaneously for both groups. All tests except the intervention remained same for both groups.

The sample of the study comprises of middle aged women between 40-65 years age of selected areas of old Jammu city. 200 middle aged women from selected areas of old Jammu city. A simple random sampling technique using random number table was used and assigned 100 each to experimental and control group.

Life Style and Stress Scale consists of 43 specific life events structured interview questions. The events refer to the life

changes that are common to individuals in a wide variety of situation. Scoring is on 7 point scale ranging from extremely negative to extremely positive.

Mini Mental Status Examination was used to assess cognitive skills in people with suspected dementia. It consists of 12 questions which examine orientation, memory and attention as well as the ability to name objects, follow verbal and written commands, and write a sentence spontaneously and a copy of complex shape.

Descriptive analysis were performed on the sample groups to obtain a clear understanding of the population measures of central tendency (mean, median and other percentiles) and dispersion (standard deviation and ranges) were computed. Inferential analysis was performed to decide the outcome of the study.

RESULTS

Table - 1. Description of demographic variables and the levels of cognitive functioning of Subjects of experimental group N = 100

Demographic Variables	Category	Sample Exp. Group	Subjects level of Cognitive Functioning						X2 Value	P Value
			Questionably Significant		Mild		Moderate			
			N	%	N	%	N	%		
Age Group (Years)	40-45	37	31	74.7	6	50.7	0	-	6.08	<0.05
	46-50	35	28	72.3	7	55.1	0	-		
	51-55	18	6	66.7	12	58.6	0	-		
	56-60	8	5	65.2	3	42.9	0	-		
	61-65	2	0	-	2	61.1	0	-		
Language	English	0	0	-	0	-	0	-	2.63 NS	>0.05
	Hindi	38	30	71.6	5	41.8	3	11.8		
	Punjabi	37	27	72.2	7	46.2	3	11.3		
	Dogri	25	16	70.5	9	50.3	0	-		
Educational Level	Under 10th	3	0	-	3	44.8	0	-	6.09	<0.05
	10th Standard	7	3	40.0	3	42.9	1	10.4		
	12th Standard	30	19	73.1	11	68.3	0	-		
	Graduate	50	45	78.8	5	69.1	0	-		
	Post Graduate	10	4	62.3	6	52.2	0	-		
Marital Status	Single	6	6	66.9	0	-	0	-	5.94	<0.05
	Married	69	44	81.8	25	74.3	0	-		
	Separated	5	0	-	4	22.9	1	11.2		
	Divorced	6	2	22.6	2	21.8	2	13.8		
	Widow	14	10	68.2	4	50.2	2	16.1		
Household income	Under 10000	25	18	77.2	7	60.4	0	-	0.81 NS	>0.05
	10000-20000	25	19	73.5	6	58.4	0	-		
	20000-30000	24	18	77.6	6	63.1	0	-		
	Above 30000	26	19	75.9	7	57.7	0	-		
Area of Living	Urban	45	31	76.6	14	68.2	0	-	0.39 NS	>0.05
	Sub-Urban	43	33	78.9	10	65.0	0	-		
	Rural	12	10	65.3	2	55.1	0	-		
No. of children	None	6	4	60.6	2	37.5	0	-	2.81 NS	>0.05
	One	23	19	69.2	1	39.2	0	-		
	Two	48	40	85.5	8	55.0	0	-		
	More than 2	23	17	67.8	6	38.5	0	-		

Working Area	Govt.	22	15	68.7	7	32.9	0	-	0.66 NS >0.05
	Private	54	42	88.4	12	59.2	0	-	
	Other	24	16	72.0	8	55.2	0	-	
Religion	Hindu	24	15	68.0	9	46.7	0	-	0.79 NS >0.05
	Muslim	29	19	71.0	10	42.7	0	-	
	Christian	20	12	67.5	8	36.4	0	-	
	Sikh	22	17	69.2	5	37.3	0	-	
Type of Family	Other	5	5	62.5	0	-	0	-	5.84 <0.05
	Nuclear	53	40	79.4	13	42.4	0	-	
Type of House	Joint	47	36	72.4	11	32.1	0	-	0.33 NS <0.05
	Own	62	49	88.3	13	49.6	0	-	
	Rent	20	12	76.8	8	40.0	0	-	
	Govt.Acco.	18	10	72.4	8	38.2	0	-	
Type of Employment	Full time	65	48	80.0	17	46.1	0	-	0.33 NS <0.05
	Part Time	12	9	65.8	3	27.2	1	10.4	
	Self emplo.	23	18	73.2	5	29.0	1	11.7	
	Combined	100	17	60.8	11	39.4	0	10.1	

* Significant at 5% level NS - Non significant

Table - 2. Description of demographic variables and the levels of cognitive functioning of Subjects of control group N = 100

Demographic Variables	Category	Sample Exp. Group	Subjects level of Cognitive Functioning				X2 Value	P Value		
			Questionably Significant		Mild				Moderate	
			N	%	N	%			N	%
Age Group (Years)	40-45	36	20	70.3	16	68.4	0	-	5.33 <0.05	
	46-50	35	25	72.1	10	42.0	0	-		
	51-55	17	7	68.3	10	59.3	0	-		
	56-60	8	3	64.0	5	58.4	0	-		
	61-65	4	2	61.4	2	55.8	0	-		
Language	English	5	1	30.4	4	28.7	0	-	0.01 NS >0.05	
	Hindi	40	24	78.8	16	62.5	0	-		
	Punjabi	38	17	68.8	21	55.1	2	18.4		
	Dogri	17	6	66.7	11	60.4	2	16.8		
Educational Level	Under 10th	3	0	-	3	33.3	0	-	4.26 <0.05	
	10th Standard	7	3	40.0	4	36.2	1	13.3		
	12th Standard	34	24	72.7	10	68.5	1	15.2		
	Graduate	34	23	70.3	11	68.0	0	-		
	Post Graduate	22	11	68.1	11	62.3	0	-		
Marital Status	Single	8	4	60.0	4	60.0	0	-	4.38 <0.05	
	Married	69	41	80.2	28	71.2	0	-		
	Separated	6	1	11.8	5	31.2	0	-		
	Divorced	7	2	16.2	4	22.2	1	11.0		
	Widow	10	2	26.3	7	26.9	1	11.3		
House hold income	Under 10000	16	7	48.0	9	44.8	0	-	0.66 NS >0.05	
	10000-20000	29	9	42.9	20	39.1	0	-		
	20000-30000	27	18	74.7	9	69.2	0	-		
	Above 30000	28	16	72.3	12	70.3	0	-		

Area of Living	Urban	43	17	69.2	26	60.1	0	-	0.92 NS >0.05
	Sub-Urban	45	21	62.8	24	53.2	0	-	
No. of children	Rural	12	4	56.2	8	43.2	0	-	0.45 NS >0.05
	None	4	1	15.7	3	20.7	0	-	
	One	22	17	65.3	5	60.1	0	-	
Working Area	Two	52	13	64.2	39	56.2	0	-	0.78 NS >0.05
	More than 2	22	10	57.4	12	51.0	0	-	
	Govt.	23	10	56.8	13	49.1	0	-	
Religion	Private	52	16	62.0	36	48.0	0	-	1.18 NS >0.05
	Other	25	16	64.2	9	42.0	0	-	
	Hindu	27	10	58.2	17	58.0	0	-	
	Muslim	25	9	57.3	16	55.1	0	-	
Type of Family	Christian	20	11	63.3	9	57.6	0	-	4.42 <0.05
	Sikh	24	17	68.8	7	56.0	0	-	
	Other	4	1	15.7	3	20.7	0	-	
Type of House	Nuclear	48	36	72.2	12	67.1	0	-	0.02 >0.05
	Joint	52	24	70.4	28	62.0	0	-	
Type of Employment	Own	59	27	71.8	32	68.5	0	-	4.92 NS <0.05
	Rent	23	16	67.2	7	56.0	0	-	
	Govt. Accommodation	18	8	58.3	10	50.2	0	-	
	Full time	62	23	66.6	39	65.8	0	-	
Type of Employment	Part Time	11	5	55.1	6	55.0	1	10.6	11.3
	Self empl.	27	11	68.2	16	60.3	1	11.3	
	Combined	100	13	56.4	9	28.7	1	10.2	

* Significant at 5% level

N S

Non significant

Table 1 & 2 data shows that demographic variables such as age, educational level, marital status, family type and type of employment were significantly associated with the levels of cognitive functioning scores and languages, household income, area of living, no. of children working area, religion and type of employment components were not significantly associated with the levels of cognitive functioning in post test period.

Table-3. Dimension wise pre test and post test mean score of cognitive functioning on both experimental and control group.

Dimensions	Subjects Scores (%)						Paired 't' test
	Experimental Group				Enhancement Test Experimental Group		
	Pre-Test		Post Test		Mean	SD	
	Mean	SD	Mean	SD			
Orientation	80.0	42.5	89.7	44.5	9.7	2.0	19.60*
Registration	45.0	17.7	82.3	24.5	37.3	6.8	12.75
Attention	54.5	26.7	85.6	38.6	31.1	11.9	24.86
Calculator	54.5	26.7	85.6	38.6	31.1	11.9	18.49
Language	64.0	28.6	81.0	32.0	17.8	3.4	22.90
Combined	64.5	26.6	84.6	24.6	31.8	11.8	24.84

Table-3.2. Dimension wise pre test and post test mean score of cognitive functioning on control group. N = 100

Dimensions	Subjects Scores (%)						Paired 't' test
	Control Group		Enhancement Test		Control Group		
	Pre-Test Mean	SD	Post Test Mean	SD	Mean	SD	
Orientation	78.5	45.0	78.7	46.0	0.2	1.0	7.75
Registration	42.0	22.0	43.0	23.0	1.0	1.0	9.92
Attention	51.8	26.6	51.9	26.4	0.1	0.2	13.26
Calculator	51.8	26.6	51.9	26.4	0.1	0.2	10.36
Language	55.5	26.6	58.2	27.1	2.7	0.5	8.63
Combined	52.7	20.8	68.4	28.2	0.1	0.2	10.70

t = (0.05, 59 df) = 1.96 * significant at 5%

The highest improvement mean percentage in experimental group was 37.3 percent with 't' value of 12.75 is obtained from MMSE score regarding registration followed by 31.1 percent 't' value of 24.86 from attention. 31.1 percent with 't' value of 18.49 from calculation, 17.8 percent with 't' value of 22.90 from language parameter and 9.7 percent with 't' value of 19.60 from orientation obtained from cognitive functioning. Attention and language is highly significant at p < 0.005 level, whereas control group subject had negligible improvement

Table-4. Overall mean scores of subjects on life style and stress in both experimental and control group before interventions. N = 100+100

LS Scores	Experimental Group		Control Group		X2 Value	Paired value
	Mean	SD	Mean	SD		
Positive Sec-I	6.22	6.28	7.04	7.90	0.19	<0.001
Positive Sec-II	4.66	4.36	5.64	6.43	0.53	
Negative Sec-I	9.74	8.07	9.57	6.66	0.56	<0.001
Negative Sec-II	6.87	5.97	6.71	5.51	0.88	
Total Negative	11.53	11.08	16.61	10.23	0.63	<0.001
Total Positive	15.97	8.1	12.35	8.82	0.64	

The table depicts the overall mean scores of subjects on Life style and stress in both experimental and control group. The highest mean was 9.74% with a 0.56 value followed by 6.87 with a value of 0.88 in negative life experiences scores in experimental group. The control group represented the mean score of 9.57 with a 0.56 values in section I, whereas the section II had 6.71 percent mean with a value of 0.88.

Table - 5. Relationship between cognitive functioning scores and stress scores of subjects in both experimental and control group before intervention. N = 200

LES Scores	Stress Scores	Cognitive Scores	Grade Point Average
Positive	0.08	0.06	-0.21
Negative	.29**	0.46***	-0.38***
Total	0.24*	0.36***	-0.40***
Balance (+ve + -ve)	-21*	-36***	0.18

The data interpreted the relationship between cognitive scores and stress scores of respondents in both experimental and control group before intervention.

Altogether, it was evident that a significant difference of -0.38 in average grade points was seen in negative scores whereas -0.21 average grade points were witnessed in positive scores. The higher grade points showed that the negative life changing scores were significantly related to the number of stress scores of respondents.

The balance or absolute value of positive and negative score was at 0.18 of average grade points.

Table - 6. Overall mean scores of subjects on opinion for structured cognitive stimulation in both experimental and control group. N = 100+100

Interest	Experimental Group		Control Group		Exp		Control	
	Mean	SD	Mean	SD	Mean%	SD%	Mean%	SD%
Cognitive Activities	25.2	2.9	15.0	0.8	88.6	44.2	52.6	26.2
Physical Activities	20.4	4.4	8.1	1.5	82.4	38.8	42.0	21.6
Indoor Games	18.9	3.1	5.6	0.36	81.1	34.6	48.3	23.8
Recreational Activities	19.6	2.8	4.8	1.2	78.0	32.0	41.8	22.4

The tabular representation illustrates the summary of the results of mean scores to assess the opinion of the subjects for structured intervention in both experimental and control group. The data witnessed that highest mean 88.6 percent was attained for cognitive activities followed by 82.4 percent for physical activities. The games activities showed 81.1 percent where as 78.0 percent was for recreational activities in experimental group.

DISCUSSION

In this study the highest 58 percent subjects were related to the mild category level of cognitive functioning, 32 percent of subjects were related to questionably significant level of cognitive functioning and 10 percent were of moderate level of cognitive functioning in experimental group. The overall mean cognitive score was 54.5 percent in experimental group and 55.5 percent was in control group in the pre-test. There was increase in the mean overall cognitive score of 86.5 percent in the post test with standard 't' value 38.96 which is found to be significant at 0.05 level ($t = 1.96, p < 0.05$) in experimental group.

There was a slight pickup in the mean overall cognitive score of 57.2 percent in the post test with standard 't' value 26.26 which is found to be shrinking at 0.05 level ($t = 1.96, p < 0.05$).

The total stress scores of subjects is 0.24 with p value is < 0.001 . The absolute value for both scores is -21 and -36 with

p value < 0.05 and < 0.001 and overall grade point is 0.18. The negative absolute values for both scores indicate that there is a significant relationship between cognitive scores and stress scores of subjects in both experimental and control group before intervention.

In the present study, the highest mean percentage 86.6 percent is witnessed in cognitive activities as well 82.4 percent in physical activities in experimental group while on the contrary 52.6 percent opinion is favored by the control group in cognitive activities. The other activities showed striking difference with experimental group. The findings strongly suggests that the middle aged women with early symptoms of dementia should be administered structured cognitive stimulation to enhance cognitive functioning as well to detect the early symptoms of dementia.

CONCLUSION

This research demonstrated the cognitive function score on cognitive functioning. However, the subjects with mild cognitive score were positively benefitted and shifted towards questionably significant level of cognition. This provides a set of baseline data that can be cited for further studies. The Structured Cognitive Stimulation could be incorporated into pre-services or in-service education program in order to evaluate its effectiveness in different populations and settings. This replication would further investigate and reinforce the

findings of the SCS in terms of improving cognitive functioning scores as well as to validate the feasibility and sustainability. The SCS had a positive impact on middle aged women of experimental group. This study has provided a new knowledge that can help in the early identification of symptoms of dementia and the ways to enhance their level of cognitive functioning.

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