THE ROLE OF LEISURE ACTIVITIES THROUGH ADULT LIFE SPAN, A COMPARATIVE STUDY BETWEEN MCI PATIENTS AND HEALTHY OLDER ADULTS

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BACKGROUND

Within the framework of Cognitive Reserve (CR) hypothesis, several studies [1,2] point out the beneficial role of social participation in the biopsychosocial well-being of the elderly, especially in regard to cognition. The participation in activities in free time turns out to be an environmental factor that can collaborate, or act as a buffer to the appearance of diseases that affect cognition such as Alzheimer's Disease and other dementias [3]. Free time acquires new functions in old age, many activities that were previously possible to perform through the profession or family obligations, now must be guaranteed by occupying free time, so thanks to the neuronal plasticity this stage of life is an opportunity for the incorporation of prevention strategies and strengthening of cognitive functions of older adults [4].

OBJECTIVE

The aim of the present study is to analyze whether there is a difference in the participation in leisure activities between MCI patients and healthy older adults

HYPOTHESIS

Within the framework of the CR theory there are some differences in Social Participation between patients with MCI and healthy older adults, in favor of the latter that promote a healthier cognitive pattern of cognitive aging.

METHOD

- **Design and Setting**

This was a retrospective correlation cross-sectional study of cognitive normal older adults. It was performed at the Institute of Neuroscience Buenos Aires (Ineba), the Hospital of Acute Abel Zubizarreta and the Foundation for the Fight against Neurological Diseases of Childhood (Fleni), located in the City of Buenos Aires, Argentina.

- **Subjects**

130 subjects, 80 MCI patients and 50 healthy older adults were assed. The subjects were recruited from Ineba, Fleni and the Zubizarreta Hospital. The selection of the sample was made through the non-probabilistic intentional statistical sampling strategy called accidental. All study participants lived in a large urban center and areas of influence (Autonomous City of Buenos Aires and Greater Buenos Aires, Argentina) and had to fulfill the following criteria:

-Inclusion criteria: To be part of the study subjects supposed to be aged 60 or over, self-validated, with a minimum level of education of 6th grade and signing of informed consent.

-Exclusion criteria: Suffer from chronic, uncontrolled, severe or end-stage chronic diseases and present diagnostic criteria according to DSM IV for addictions, mental retardation, dementias, schizophrenia and other psychotic disorders

- **Procedures**

Each subject underwent an individual uniformed structured evaluation that lasted 90 minutes approximately. The study was performed with the approval of the institutional review board. The research was performed in compliance with the Helsinki Declaration [5]. Written informed consent was given by all participants

- **Measures**

-Questionnaire of Social Demographic Data (built ad hoc)

-Questionnaire of Social Participation Moragás Moragás [6].

- A neurological interview and a set of neuropsychological tests was used to asses cognitive performance in different areas and differentiate the subjects of both groups: Memory(Logic Memory Signoret Battery [7], Recall of a word list (TAVEC) [8]); Attention (Digit span WMS III [9], TMTA [10]); Language (Vocabulary WAISIII[11], Boston Naming Test [12], Verbal Fluencies[12]); Executive functions (TMTB [10], Analogies WAIS III [11], Matrix reasoning WAISIII [11]; Visuoconstruction Cubes WAISIII [11]).

- **Statistic Analysis of Information**
- Percentages, arithmetic mean and standard deviation.
- Variance analysis (ANOVA)

RESULTS

Table 1 shows the sociodemographic profiles of healthy older adults and MCI patients. Table 2 shows the diagnostics of MCI patients

Table 1: Sociodemographic data

Variables	Healthy Older Adults	MCI patients
Gender M/F (n, %)	18/32 (32/64)	25/55(32/68)
Age (years) (media , DS)	71.9± 8.8	76.59 ± 6.6
Education (years)(media, DS)	14.10± 4.2	11.30± 3.71
Nationality (n, %)	Argentine 49 (98) Foreign 1 (2)	Argentine 72 (89) Foreign 8 (11)
Marriage status (n, %)	Single 4 (8) Married 27 (54) Widow 9(18) Divororced 10 (20)	Single 2 (4) Married 50 (62) Widow 23(28) Divorced 5 (6)
Occupation (n, %)	Ordenance worker 8(15) Employee 16 (32) Seller 6 (12) Teacher/Professor 6 (12) Independent profesional 6 (12) Executive 8(16)	Ordenance worker 23 (25) Employee 28 (34) Seller 11 (15) Teacher/Professor 7 (9) Independant profesional 6 (7) Executive 5 (6)
Years of work (media DS)	35.26 ± 15.17	28.75 ± 17.44
Hours of work (media, DS)	44.34 ± 11.43	41.43 ± 13.61
IQ	103 ± 8.11	95.11 ± 11.84

Table 2:MCI patients

Diagnostic (n, %)	MCI amnesic single domain 21 (24) MCI amnesic multiple domain 48 (58) Non amnesic MCI single domain 5 (6) No amnesic MCI multiple domain 8 (12)

Table 3 shows the arithmetic means and standard deviations in the performance, of MCI patients and healthy older adults in neuropsychological tests. In the last column that corresponds to each one of the tests, the F values observed in the ANOVA are presented.

Table 3 : Performance in neuropsychologocal tests (z scores) between MCI patients and healthy older adults

Neuropsychological Tests (Puntaje z)	MCI		HELATHY OLDER ADULTS		
Neuropsychological Tests	**M**	**ds**	**M**	**ds**	ANOVA F °
Memoria					
Logic Mmeory IR	-1-36	1.1	.59	1.1	66.06***
Logig Memory DR	-1.28	1.2	.37	1.03	55.19***
CVLT IR	-1.19	.98	.081	.59	62.83***
CVLT DR	-1.38	1.18	-.13	.70	54.99***
CVLT REC	-.63	1.08	.14	.60	25.63
Attention					
Digits Direct	.16	1.3	.62	1.2	4.53*
Inverse Digits	-.42	.71	.22	.66	45.57***
TMT A	-1.15	1.16	-.24	.71	12.28***
Lenguage					
Boston	-1.02	1.28	.02	.83	34.67***
Semantic FI.	.15	.71	.62	.65	15.79***
Fonological FI.	.07	1.08	.66	.94	18-60***
Vocabulary WAIS III	.16	.71	.62	.56	15.79***
Executive Functions					
Analogies WAIS III	-.65	1.16	-.24	.71	29.35***
Matrix Reasoning WAIS III	-.23	.89	.17	.56	10.23**
CubES WAIS III	-.42	.71	-.22	.66	30.69***
TMT B	-1.15	1.16	.22	.66	45.57***

*** p< . 01 ** p < .05 ** p< . 01

Tables 4 and 5 shows the arithmetic means and standard deviations in leisure activities participation in adulthood and in old age, of MCI patients and healthy older adults, the F values observed in the ANOVA are presented.

Table 4: Leisure time activities Healthy older adults vs. MCI patients in adulthood (40-50 years old)

Leisure Activities	Diagnostic Healthy Older Adults		MCI		ANOVA
	M	ds	M	ds	F °
Participation in Psyical activities in adulthood	.72	.55	.75	.50	.82
Participation in Social activities in adulthood	1.50	.64	.1.25	.55	3.72*
Participation in Recrational activities in adulthood	1.90	1.03	1.45	.53	3.55*
Participation in Educational activities in adulthood	.89	.61	.60	.40	7.09**
Participation in Political activities in adulthood	.41	.05	.37	.04	1.13
Participation in Religous activities in adulthood	.50	.45	.57	.50	.45

*p <.05 ** p <.01

Table 5: Leisure time activities Healthy older adults vs. MCI patients in old age

Leisure Activities	Diagnostic Healthy Older Adults		MCI		ANOVA
	M	ds	M	ds	F °
Participation in Psyical activities in old age	.52	.51	.57	.50	.50
Participation in Social activities in old age	1.28	.73	1.21	.61	.52
Participation in Recrational activities in old age	1.24	.36	1.09	.38	3.02*
Participation in Educational activities in old age	.76	.57	.46	.35	13.03*
Participation in Political activities in old age	.06	.20	.06	.22	.90
Participation in Religous activities in old age	.53	.58	.57	.44	.18

*p <.05 ** p <.01

DISCUSSION

These results agree with other studies [13-15] which identified the factors that promote healthy cognitive aging in older adults. Within the framework of cognitive reserve, participation in social,recreational, and educational activities play a differential and important role in the enhancement of cognitive abilities, being important buffers of cognitive deterioration in the aging process. The present study adds empirical evidence of interest for the clinical and scientific fields of healthy cognitive ageing. The evaluation of these measures would be adequate indicators of the cognitive reserve of the subject, pointing out the possible courses of cognitive aging that the subject will experience. The findings of this study provide elements of judgment of interest to professionals who are dedicated to the care of older adults and to the planning of social policies, both public and private, that favor their social participation and general well-being.

REFERENCES

1. Fratiglioni L, Paillard-Borg,S, Winblad B. An active and socially integrated lifestyle in late life mightprotect against dementia. Lancet Neurology. 2004; 3(6):242–53.10.1016
2. Cherry, K. E., Walker, E. J., Brown, J. S., Volaufova, J., Lamotte, L. R., Welsh, D., Frisard, M. I. (2013). Social Engagement and Health in Younger, Older, and Oldest-Old Adults in the Louisiana Healthy Aging Study (LHAS). Journal of applied gerontology : the official journal of the Southern Gerontological Society, 32(1), 51–75.
3. Desai, A. K., Grossberg, G. T., & Chibnall, J. T. (2010). Healthy brain aging: a road map. Clinics in geriatric medicine, 26(1), 1–16.
4. Valenzuela MJ, Sachdev P. Brain reserve and dementia: a systematic review. Psychological Medicine.2006b; 36(4):441–454.
5. Asociación Médica Mundial.Declaración de Helsinski. Principios éticos para las investigaciones médicas en seres humanos. Rev Neurol Argent.2001; 26, 75-77.
6. Moragas Moragas. Gerontología Social: Envejecimiento y calidad de vida. Barcelona: Ed. Herder;1991.
7. Signoret JL, Whiteley A. Memory battery scale. Intern Neuropsych Soc Bull . 1979;2: 2-26.
8. Benedet MJ, y Alejandre MA. Test de Aprendizaje Verbal España-Complutense (TAVEC). Madrid: TEA Ediciones; 1998.
9. Wechsler, D. y Stone, C.P. Wechsler Memory Scale - Revised. Psychological Corp; 1987.
10. Reitan RM. Validity of the Trail Making Test as an indication of organic brain damage. Percept Mot Skills.1958; 8: 271-275.
11. Weschsler D. WAIS III: Test de Inteligencia para adultos. Buenos Aires: Ed. Paidos; 2002.
12. Allegri RF, Mangone CA, Rymberg S, et al. Spanish version of the Boston naming test in Buenos Aires. Clin Neuropsychol.1997; 11(4): 416-420
13. Fritsch,T McKee J. McClendon, K Smyth, A. J. Lerner, RP. Friedland,J D. Larsen,J.D (2007) Cognitive Functioning in Healthy Aging: The Role of Reserve and Lifestyle Factors Early in LifeThe Gerontologist, Volume 47, Issue 3, 1 :307–322.
14. Lojo-Seoane,C, Facal, D, Guardia-Olmos J, Juncos-Rabada, O.(2014). Structural Model for Estimating the Influence of Cognitive Reserve on Cognitive Performance in Adults with Subjective Memory Complaints Archives of Clinical Neuropsychology 29 (2014) 245 – 255.
15. Stern Y. Cognitive reserve. Neuropsychologia. 2009; 47:2015–2028.
16. Marioni, R.E., Proust-Lima, C., Amieva, H., Brayne, C., Matthews, F.E., Dartigues, J.F. & Jacqmin-Gadda, H. (2014).Cognitive lifestyle jointly predicts longitudinal cognitive decline and mortality risk. European Journal of Epidemiology. 29(3):211-9.