

Normative Data For The Mini-Mental State Examination (MMSE) In Older Adults From Panama



P- 0845

Diana Carolina Oviedo^{1,2,4}, Adam E. Tratner^{3,4}, Gabrielle B. Britton^{4,5}, Sofía Rodríguez Araña^{1,2}, Alcibiades E. Villarreal^{1,4}, Giselle Angeline Rangel Tapia, PhD^{1,4}

¹ Neuroscience Group, Instituto de Investigaciones Científicas y Servicios de Alta Tecnología (INDICASAT- AIP), Panamá, Panama, ² School of Psychology, Universidad Santa María La Antigua, Panama, Panama, ³ Florida State University, Panamá, Panama, ⁴ Sistema Nacional de Investigación, Panama, ⁵ Centro de Vacunación e Investigación (CEVAXIN), Panamá, Panama

This study provides the first steps into developing normative data for the Mini Mental State Examination in Panama. Results show differences in demographic characteristics such as a age and level of education; no sex differences were found. In regression analyses, education and age explained a significant proportion of variance in MMSE.

INTRODUCTION	RESULTS	RESULTS	REFERENCES																																																				
Normative neuropsychological data are limited in Latin America, particularly in countries like Panama, restricting the interpretation of cognitive assessments¹⁻⁴. Objective: Generate normative estimates for the Mini Mental State Examination in a Panamanian sample from the Panama Aging Research Initiative- Health Disparities (PARI-HD).	Participants were on average 70.9 years old (SD=7.0), had 15.2 years of education (SD=5.0) and were predominantly female (74.1%). Mean MMSE score was 27.47 (SD = 2.24). MMSE performance varied by age $F(2, 665) = 9.24, p < .001, \eta^2_p = .027$ with lower scores in participants aged 80+, the two younger groups did not differ. Likewise, MMSE varied by education $F(3, 664) = 23.31, p < .001, \eta^2_p = .095$ with lower scores among participants with less than high school education. Participants with postgraduate education scored significantly higher than participants with high school education. No sex differences were found, $F(1, 666) = 0.11, p = .736$.	Table 1. Demographic characteristics and MMSE scores of study participants. <table><tr><th>Variable</th><th><i>n</i> (%)</th><th><i>M</i> / <i>SD</i></th><th><i>p</i>-value</th></tr><tr><td>Sex</td><td></td><td></td><td><i>p</i> = .736</td></tr><tr><td>Male</td><td>173 (25.9%)</td><td>27.42 (2.3)</td><td></td></tr><tr><td>Female</td><td>495 (74.1%)</td><td>27.49 (2.2)</td><td></td></tr><tr><td>Age Group</td><td></td><td></td><td><i>p</i> < .001</td></tr><tr><td>60 - 69</td><td>338 (50.6%)</td><td>27.66 (2.2)</td><td></td></tr><tr><td>70 - 79</td><td>258 (38.6%)</td><td>27.51 (2.1)</td><td></td></tr><tr><td>≥ 80</td><td>72 (10.8%)</td><td>26.43 (2.8)</td><td></td></tr><tr><td>Highest Education Attained</td><td></td><td></td><td><i>p</i> < .001</td></tr><tr><td>Less than high school</td><td>92 (13.8%)</td><td>25.79 (2.8)</td><td></td></tr><tr><td>High school</td><td>154 (23.1%)</td><td>27.45 (2.3)</td><td></td></tr><tr><td>Undergraduate</td><td>291 (43.6%)</td><td>27.79 (1.9)</td><td></td></tr><tr><td>Postgraduate</td><td>131 (19.6%)</td><td>27.95 (1.9)</td><td></td></tr></table> Note: M = mean; SD = standard deviation MMSE scores were regressed separately onto sex (male, female), age (years), and education (years). Sex did not predict MMSE, $F(1, 667) = 0.11, MSE = 0.57, R = 0.01, R^2 = 0.00, p = .736$. Age explained a significant proportion of variance in MMSE, $F(1, 667) = 18.28, MSE = 89.67, R = 0.16, R^2 = 0.03, p < .001$. Education explained a significant proportion of variance in MMSE, $F(1, 667) = 52.90, MSE = 247.00, R = 0.27, R^2 = 0.07, p < .001$.	Variable	<i>n</i> (%)	<i>M</i> / <i>SD</i>	<i>p</i> -value	Sex			<i>p</i> = .736	Male	173 (25.9%)	27.42 (2.3)		Female	495 (74.1%)	27.49 (2.2)		Age Group			<i>p</i> < .001	60 - 69	338 (50.6%)	27.66 (2.2)		70 - 79	258 (38.6%)	27.51 (2.1)		≥ 80	72 (10.8%)	26.43 (2.8)		Highest Education Attained			<i>p</i> < .001	Less than high school	92 (13.8%)	25.79 (2.8)		High school	154 (23.1%)	27.45 (2.3)		Undergraduate	291 (43.6%)	27.79 (1.9)		Postgraduate	131 (19.6%)	27.95 (1.9)		1.2018 / Revista Ecuatoriana de Neurología 25. (n.d.). https://revecuatneurol.com/wp-content/uploads/2019/04/2631-2581-rneuro-27-03-00025.pdf 2.Artículo, D., & Investigación. (2023). Nuevos datos normativos para el Mini Mental State Examination (MMSE) en la población de personas mayores en Chile Development of Normative Data for the Mini Mental State Examination (MMSE) in the Elderly Population of Chile: A Multi-City Study. Rev Med Chile, 151, 1464–1470. https://www.scielo.cl/pdf/rmc/v151n11/0717-6163-rmc-151-11-1464.pdf 3.Chamba , F. (2025). Diagnosticos del Deterioro Cognitivo en Adultos Mayores en la Atencion Primaria en Salud. 1–22. https://repositorio.utmachala.edu.ec/server/api/core/bitstreams/1de378ab-8113-4d08-b5d9-7e4ec233f668/content 4.Rojas-Gualdrón, C., Fernando, D., Segura, Cardona, A., Segura, D., & Osley, Á. (2017). CES Psicología. CES Psicología, 10, 17–27. https://www.redalyc.org/pdf/4235/423553242002.pdf
Variable	<i>n</i> (%)	<i>M</i> / <i>SD</i>	<i>p</i> -value																																																				
Sex			<i>p</i> = .736																																																				
Male	173 (25.9%)	27.42 (2.3)																																																					
Female	495 (74.1%)	27.49 (2.2)																																																					
Age Group			<i>p</i> < .001																																																				
60 - 69	338 (50.6%)	27.66 (2.2)																																																					
70 - 79	258 (38.6%)	27.51 (2.1)																																																					
≥ 80	72 (10.8%)	26.43 (2.8)																																																					
Highest Education Attained			<i>p</i> < .001																																																				
Less than high school	92 (13.8%)	25.79 (2.8)																																																					
High school	154 (23.1%)	27.45 (2.3)																																																					
Undergraduate	291 (43.6%)	27.79 (1.9)																																																					
Postgraduate	131 (19.6%)	27.95 (1.9)																																																					
METHODOLOGY Data from three PARI-HD cohorts were analyzed, including 668 dementia-free adults aged ≥60 years who had been assessed with comprehensive clinical, physical and cognitive tests.	CONCLUSIONS Preliminary MMSE norms have been established for participants ≥60 years in a Panamanian sample. Next steps include to compare MMSE to other scales to determine cutoff scores for different diagnostic groups.		CONTACT Diana Oviedo, Ph.D. DOviedo@indicasat.org.pa  INDICASAT Official Website  Instagram Account: @memoriaysalud  ALZHEIMER'S ASSOCIATION AAIC 26																																																				