

Linguistic biases in Cognitive Screening

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Illiteracy and low literacy in Latin America are highly frequent, and its high cultural richness makes it difficult for validating internationally used cognitive screening tests to the Spanish language.
It is crucial to direct efforts into creating ecological cognitive screenings, less dependent on the educational background and with more tasks focused into replicating the cognitive processes used in daily living.

INTRODUCTION	METHODS	CONCLUSIONS	REFERENCES
Patients with low education and illiterates are at risk of being classified as cognitively impaired due to educational biases in Cognitive Screening tests. Our aim is to describe the effects of low literacy in results of Cognitive Screening in the most frequently used tools, such as the Mini-Mental State Examination (MMSE), Montreal Cognitive Assessment (MoCA) and Addenbrooke Cognitive Examination (ACE-III) and the most affected cognitive domains due to low literacy. Additionally, we discuss the difficulty in the validation of cognitive screening to the Spanish language.	In this critical review, we conducted a search of Google Scholar, Pubmed, Scielo and LILACS electronic databases of cross-sectional, prospective studies, critical and systematic reviews with adults over 50 years of age. Studies in English and Spanish were both included. RESULTS Studies focusing on MMSE, ACE-III and MoCA showed a significant educational bias in the total score. In particular, tasks involving reading, writing, arithmetic, phonological and semantic fluency, visuospatial and visuoconstructive skills (such as the clock drawing test or Necker’s cube) have proven to be more challenging for illiterate or low literacy individuals. On the contrary, tasks reliant on executive functions, immediate, delayed and logical memory, orientation and abstract reasoning seem to be mostly unaffected by educational bias. Tasks, such as semantic fluency or naming, may be affected by the difficulty of the instruction or stimuli (ecological, such as supermarket objects vs schooling-dependent, such as animals) presented to the patient.	Low literacy individuals exhibit a lower performance on a large array of items present in traditional cognitive screening. Additional tools, such as adapted cognitive screening and cutoff scores for low educational background, executive function screening and familiar/caregiver report, should be used to mitigate the risk of misdiagnosis when a comprehensive neuropsychological assessment is not available. Calculation, naming, writing, copying and drawing are extremely common tasks present in the mostly used cognitive screenings, and are also some of the ones people with illiteracy or low literacy tend to perform the worst when compared against people with a higher educational background.	1.Rosario Nieves, E., Rosenstein, L. D., González, D., Bordes Edgar, V., Jofre Zarate, D., & MacDonald Wer, B. (2024). Is language translation enough in cross-cultural neuropsychological assessments of patients from Latin America?. <i>Applied Neuropsychology: Adult</i>, 1-12.Rosario Nieves, E., Rosenstein, L. D., González, D., Bordes Edgar, V., 2.Jofre Zarate, D., & MacDonald Wer, B. (2024). Is language translation enough in cross-cultural neuropsychological assessments of patients from Latin America?. <i>Applied Neuropsychology: Adult</i>, 1-12. 3.Nielsen, T. R. (2022). Cognitive assessment in culturally, linguistically, and educationally diverse older populations in Europe. <i>American Journal of Alzheimer’s Disease & Other Dementias</i>®, 37, 15333175221117006. 4.Nielsen, T. R., & Waldemar, G. (2016). Effects of literacy on semantic verbal fluency in an immigrant population. <i>Aging, Neuropsychology, and Cognition</i>, 23(5), 578-590. 5..Calia, C., & Rodriguez, M. P. (2024). Screening tools for dementia assessment in UK based ethnic minorities. <i>Exploration of Medicine</i>, 5(3), 401-415. 6.Franzen, S., van den Berg, E., Goudsmit, M., Jurgens, C. K., Van De Wiel, L., Kalkisim, Y., ... & Papma, J. M. (2020). A systematic review of neuropsychological tests for the assessment of dementia in non-western, low-educated or illiterate populations. <i>Journal of the International Neuropsychological Society</i>, 26(3), 331-351. 7.Mandyla, M. A., Yannakoulia, M., Hadjigeorgiou, G., Dardiotis, E., Scarmeas, N., & Kosmidis, M. H. (2022). Identifying appropriate neuropsychological tests for uneducated/illiterate older individuals. <i>Journal of the International Neuropsychological Society</i>, 28(8), 862-875. 8.Tavares-Júnior, J. W. L., De Souza, A. C. C., Alves, G. S., Bonfadini, J. D. C., Siqueira-Neto, J. I., & Braga-Neto, P. (2019). Cognitive assessment tools for screening older adults with low levels of education: a critical review. <i>Frontiers in psychiatry</i>, 10, 878. 9. Pellicer-Espinosa, I., & Díaz-Orueta, U. (2022). Cognitive screening instruments for older adults with low educational and literacy levels: A systematic review. <i>Journal of Applied Gerontology</i>, 41(4), 1222-1231. 10. Palma, L. F., Bom, R. C., Victoriano, P. H. M., de Sousa, D. B., Garcia, M. B. B., Zucato, M. C. R., ... & de Carvalho Pelegrini, L. N. (2025). Cognitive performance of healthy older adults and individuals with Alzheimer’s Disease from a Latin American Country: the role of education on cognitive assessment batteries. <i>Alzheimer’s & Dementia</i>, 21(Suppl 3), e107243.