
Paper ID: 1570940959

Paper Title: Developing an Integrated Cognitive Test (ICT) for Computerized Assessment of Cognitive Impairment Risk

Authors: Warissara Limpornchitwilai, Kosin Chamnongthai, Boonserm Kaewkamnerdpong, Wisanu Jutharee and Chatchai Paengkumhag (King Mongkut's University of Technology Thonburi, Thailand)

Email: warissara.limp@mail.kmutt.ac.th

Abstract

In an aging society, dementia is a notable issue that occurs as individuals grow older, impacting cognitive ability and emotional well-being. This has led to the development of cognitive assessment tools to facilitate early detection of cognitive impairment. Limited utilization of computerized tests across different countries is due to the mismatch of existing computerized tests between the educational and cultural backgrounds of the elderly; this study sought to address this issue by developing the Integrated Cognitive Test (ICT). ICT is designed as a computerized tool for assessing the risk of cognitive impairment in Thai older adults with an easy-to-use interface. Thirty-six elderly participants with diverse education levels and without prior cognitive impairment diagnoses participated in the study. They completed MoCA, MMSE, and ICT in a single-day experiment. The scores, reaction time, and overall completion time were recorded for analysis. The study found significant differences between ICT and MMSE scores ($p < 0.001$) but not with MoCA ($p = 0.421$); the results indicated ICT's potential alignment with MoCA for cognitive assessment. The decision tree attained 80.60% accuracy in cognitive impairment risk classification using MoCA output. Key features impacting classification included average reaction time in working memory, memory recall, and standard deviation in language tasks. Overall, the analysis demonstrated that ICT is an effective tool for assessing cognitive impairment, for older adults. Furthermore, designing a cognitive test that considers the unique education and cultural backgrounds of the Thai elderly can serve as a model for creating similar tests for other populations.
