

**Review of “The Montreal Cognitive Assessment (MoCA) with a double threshold: improving the MoCA for triaging patients in need of a neuropsychological assessment” by Géraud M. F. C. Dautzenberg et al (2022).**

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**Key highlights:**

- The MoCA with a double threshold can be used to screen mild dementia and mild cognitive impairment. This method is timesaving, reduces false positive cases, and monitors those at risk.
- The optimal strategy for dementia screening is a two-stage selection process: the first step is conducting the initial assessment by psychiatrists, and the second is using the MoCA as an add-on for those clients referred for neuropsychological assessment after an initial assessment.
- Three policies are identified and can be applied in most psychiatry settings: 1) a score < 21 results in an invitation for neuropsychological assessment and full clinical follow-up; 2) a score of 21-25 means active monitoring; and a score  $\geq 26$  supports remaining watchful.

Dementia has become a public health concern that places burdens on clients, caregivers, and society at-large. It has affected more than 55 million people worldwide, and the number of people with dementia continues to rise (Gauthier et al., 2021). People also are being diagnosed with dementia at younger ages with earlier-onset (Hendriks et al., 2021); however, there is no cure for dementia. Early recognition of cognitive impairment is essential and enables clients with probable or possible states to receive active monitoring and/or timely care services.

Past research has reported several challenges including time requirements for neuropsychological assessments, diagnostic uncertainty, inadequate staff resources, and financial restraints for some clients (Dautzenberg et al., 2022). Also, cognitive impairment is an intermediate state on a continuum with cognitive disorders on one end and no cognitive impairment on the other. It is associated with psychiatric conditions, and most clients with psychiatric disorders will be diagnosed with mild dementia if the cutoff on the MoCA is 26, which increases false positives and unnecessary referrals. Therefore, mild cognitive impairment deserves concern and a relevant policy (i.e., active monitoring), but few studies of dementia assessment focus on distinguishing clients with mild cognitive impairment from those with mild dementia (Petriceks & Stern, 2021). As such, Dautzenberg et al. advocate the importance of using a short, validated screening instrument that detects both mild dementia and mild cognitive impairment.

Among those brief, common screening tools, such as Mini-Mental State Examination (MMSE) (Folstein et al., 1975) and Montreal Cognitive Assessment (MoCA) (Nasreddine et al., 2005), the MoCA is validated in at least 35 different languages and various settings, and is more sensitive in detecting mild cognitive impairment and mild dementia compared to the MMSE (Abd Razak et al., 2019; Pinto et al., 2019; Siqueira et al., 2019). However, MoCA as a triaging tool also has its limitation of low specificity, because there is usually a trade-off between specificity and sensitivity. Dautzenberg et al. claim that high sensitivity makes

MoCA a good screener to identify most mild dementia clients. Also, they insist that reducing the risk of false positives (cutoff < 21) is essential to decrease unnecessary referrals, and this can be replaced with actively monitoring for those with scores between 21-25.

The purpose of Dautzenberg et al.'s study is to compare different selection strategies for efficiently identifying clients in need of a neuropsychological assessment and identifying subsequent policy implications. Their study used the MoCA with a double threshold to address low specificity without decreasing the sensitivity to differentiate between cognitive impairment and mild dementia. A total of 693 clients referred to a psychiatric service for older adults in Utrecht, Netherlands were included in this study with ages ranging from 53-94 years, 62% female, and 47% less than 12 years of education. All referred participants were initially assessed by geriatric psychiatrists incorporating laboratory tests and medical and functional history and then screened with a MoCA within three months of referral by a trained psychiatric nurse practitioner. The mean score of MoCA was 22.1, ranging from 3-30. The diagnosis of dementia disorders, mild cognitive impairment, or no cognitive impairment for all participants was supported with at least a 4-hour neuropsychological assessment and determined by multidisciplinary teams, which was used as the reference test for comparing the results of the initial assessment, a stand-alone MoCA, and a MoCA add-on after initial assessment.

In this study, the authors found that the optimal strategy was a two-stage selection process: the first step is conducting the initial assessment by psychiatrists, and the second is using the MoCA as an add-on for those clients referred for neuropsychological testing after the initial assessment. They also supported using the MoCA with a double threshold (i.e., <21 and ≥26); that is <21 indicating mild dementia, 21-25 indicating mild cognitive impairment, and >26 indicating no cognitive impairment. Specifically, this study reported that the results of the initial assessment conducted by geriatric psychiatrists gave **the highest true positives** and also a high number of false positives. The possible reason is that clinicians not using an objective test may attempt to avoid false negatives and tend to refer them to subthreshold states. Also, the single cutoff MoCA stand-alone (<21) strategy results in **an improvement in an accuracy of 69%** (true positives and negatives / all clients) for detecting mild dementia, but increases false negatives compared to the initial assessment. Using the MoCA (cutoff <21) as an add-on after the initial assessment reduces **false positive referrals** for a neuropsychological assessment by 65% but increases false negatives and deteriorates the accuracy to 57%. Eventually, they found that using a double threshold leads to **the highest accuracy, positive predictive value, and negative predictive value, without an increase in false positive referrals**. The results also compensate for the increase in false negatives by monitoring most of the missed mild dementia cases.

Dautzenberg et al. concluded that the two-stage selection strategy, using the MoCA with a double threshold as an add-on after the initial assessment, improved the accuracy of mild dementia screening by referring most mild dementia clients and reduced unnecessary false positive referrals. This strategy also identifies clients diagnosed with mild cognitive impairment as receiving active monitoring and compensates for the potential increase in false negatives. Additionally, previous research has indicated the heterogeneity associated with such variables as physical activity and demographics affecting the MoCA score in different clinical practices. Dautzenberg et al.'s study of the two-stage selection process can be suggested as a solution in different clinical populations rather than using stratification for age, education, or other factors.

Early recognition of dementia allows people with probable dementia to receive timely intervention to mitigate disease progression. Nevertheless, the average time of a full neuropsychological assessment would add time and cost to client burden, and due to limited infrastructure, many clients likely would be placed on a waiting list. The MoCA with a double threshold can reduce waiting times and reduce associated costs by actively monitoring false positive and at-risk cases. In addition, the two-stage process can be suggested in clinical settings for efficiently selecting clients who need neuropsychological assessment, those who should be actively monitored, and those who are not diagnosed with cognitive impairment but should be watchful.

As this study focused on older adult patients in the psychiatric settings of western cultures, the validity of the two-stage process, especially in eastern cultures or developing countries, has not yet been explored. Future studies should include populations from other cultures and geographic regions to examine disparities in implementing this scale.

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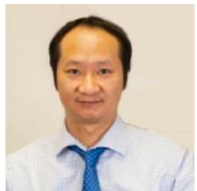
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