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Two Approaches to Cognitive Evaluation: Assessing the Strengths and Limitations of GPCOG and ACE-III

Magdalena Mąka[1], Dominik Sikora[2], Piotr Oleksy[3], Adam Zając[4], Karol Zieliński[5], Łukasz Papież[6], Ewa Góralczyk[7], Jakub Kamiński[8], Bartosz Buczkowski[9]

[1] Medical University of Silesia in Katowice, Faculty of Medical Sciences in Katowice, ul. księcia J. Poniatowskiego 15, 40-055 Katowice, śląskie, Poland

ORCID https://orcid.org/0009-0002-8702-9406, email midzia1773@gmail.com

[2] Medical University of Silesia in Katowice, Faculty of Medical Sciences in Katowice, ul. księcia J. Poniatowskiego 15, 40-055 Katowice, śląskie, Poland

ORCID https://orcid.org/0009-0006-8604-1605, email sdominik808@gmail.com

[3] Medical University of Silesia in Katowice, Faculty of Medical Sciences in Katowice, ul. księcia J. Poniatowskiego 15, 40-055 Katowice, śląskie, Poland

ORCID https://orcid.org/0009-0008-0567-0317, email poleksy99@gmail.co

[4] Medical University of Silesia in Katowice, Faculty of Medical Sciences in Katowice, ul. księcia J. Poniatowskiego 15, 40-055 Katowice, śląskie, Poland

ORCID https://orcid.org/0009-0003-1131-8700, email azajac677@gmail.com

[5] Medical University of Silesia in Katowice, Faculty of Medical Sciences in Katowice, ul. księcia J. Poniatowskiego 15, 40-055 Katowice, śląskie, Poland

ORCID https://orcid.org/0009-0009-6069-8053, email karolz2001@interia.pl

[6] Medical University of Silesia in Katowice, Faculty of Medical Sciences in Katowice, ul. księcia J. Poniatowskiego 15, 40-055 Katowice, śląskie, Poland

ORCID https://orcid.org/0009-0000-1235-0057, email lukaszpap14@gmail.com

[7] Medical University of Silesia in Katowice, Faculty of Medical Sciences in Katowice, ul. księcia J. Poniatowskiego 15, 40-055 Katowice, śląskie, Poland

ORCID https://orcid.org/0009-0006-9573-0381, email egoralczykk@gmail.com

[8] Medical University of Silesia in Katowice, Faculty of Medical Sciences in Katowice, ul. księcia J. Poniatowskiego 15, 40-055 Katowice, śląskie, Poland

ORCID https://orcid.org/0009-0006-4725-5977, email kaminskijakub34256@gmail.com

[9] Medical University of Silesia in Katowice, Faculty of Medical Sciences in Katowice, ul. księcia J. Poniatowskiego 15, 40-055 Katowice, śląskie, Poland

ORCID https://orcid.org/0009-0001-8065-632X, email bartosz.buczkowski.26@gmail.com

Abstract

Introduction

The growing elderly population underscores age as a key risk factor for cognitive disorders like dementia. Reliable assessment tools are essential. Addenbrooke's Cognitive Examination-III (ACE-III) and General Practitioner Assessment of Cognition (GPCOG) are widely used. This study compares their sensitivity, specificity, and clinical utility across healthcare settings.

Purpose of Research

The study evaluates ACE-III and GPCOG for diagnosing dementia such as Alzheimer's and frontotemporal dementia, focusing on their application in primary care and specialized settings.

Materials and Methods

This study reviewed 37 publications, including clinical trials and validation studies. Systematic searches in PubMed, NCBI, and Google Scholar used keywords such as "GPCOG," "ACE-III," "cognitive screening," and "dementia."

Results

ACE-III demonstrates high accuracy (sensitivity and specificity >93% and 96%) and excels in diagnosing complex dementia. However, its time requirements and need for trained personnel

limit its use in resource-limited settings. GPCOG is quick and user-friendly, ideal for primary care but less effective for detailed diagnostics due to its brevity.

Conclusions

ACE-III is optimal for detailed evaluations in specialized settings, while GPCOG is suited for rapid screening in primary care. Combined, they enhance early detection and management of cognitive disorders.

Keywords: Cognitive screening tools, Dementia diagnosis, ACE-III, GPCOG, Primary and specialized healthcare settings

Introduction

The growing number of elderly individuals in the population is increasing the need for effective tools for early detection of cognitive impairments, especially in primary healthcare and emergency departments. Cognitive issues, such as dementia, significantly impact patient's quality of life and present challenges to the healthcare system. Therefore, available screening tools, such as the General Practitioner Assessment of Cognition (GPCOG) and Addenbrooke's Cognitive Examination (ACE), are widely used for cognitive assessment of patients in primary care and emergency settings [Brodaty et al., 2004; Wojtowicz & Larner, 2015; Schofield et al., 2010]. GPCOG, developed to quickly detect cognitive impairments in elderly patients, has proven to be both accurate and easy to use, making it valuable for general practitioners and specialists [Brodaty, Kemp and Low, 2004]. Its effectiveness in detecting dementia, compared to other tools such as the Mini-Mental State Examination (MMSE), has been confirmed in studies, highlighting its utility in clinical practice [Brodaty et al 2016]. On the other hand, Recent studies have demonstrated the utility of the ACE-III in detecting early stages of cognitive decline and dementia in both primary and secondary care settings, such as emergency departments and geriatric wards [Beishon et al., 2019; Carpenter et al., 2019]. Its use has been particularly valuable in screening for Alzheimer's disease and frontotemporal

dementia, where early identification is key to managing disease progression [Hsieh et al., 2013].

Both tools, although differing in scope and application, play a critical role in the early identification of cognitive impairments, which can improve the quality of care for elderly patients and optimize medical interventions [Gostyńska & Ostrowska 2018, Shenkin et al., 2019]. The aim of this article is to popularize and compare the effectiveness of two screening tools - the CPCOG and the ACE - in detecting cognitive impairments in adults. In practice, doctors more often use other diagnostic tools or refrain from using any standardized screening tests at all, which may result from a lack of proper training, time constraints or low awareness of these tests in the medical community [Chmiela T, Dobrakowski P, Łabuz-Roszak B, Gorzkowska A. Diagnosis of cognitive disorders in primary health care in Poland. Psychiatr Pol. 2023 Feb 28;57(1):65-77]. This analysis seeks to raise awareness among clinicians as well as clarify which tool performs more effectively in specific clinical contexts and how each can assist healthcare providers in the prompt identification of cognitive deficits. This research is significant because early diagnosis of cognitive impairments enables timely therapeutic interventions, which can improve patients' quality of life and potentially delay the progression of more severe dementia symptoms. In the context of an aging society, widespread use of effective screening tools also could provide invaluable support for healthcare systems, allowing for better resource management and facilitating referrals for further specialized diagnostic evaluation.

Material and methods

This study employed a comprehensive approach by conducting an extensive literature review on the General Practitioner Assessment of Cognition (GPCOG) and the Addenbrooke's Cognitive Examination-III (ACE-III). A total of 37 peer-reviewed articles were analyzed to ensure a robust understanding of these tools, with particular focus on their practicality, clinical utility, and suitability across diverse healthcare settings. The review involved systematic searches across databases such as PubMed, NCBI, and Google Scholar, using relevant

keywords including “GPCOG,” “ACE-III,” “cognitive screening,” “cognitive function,” “cognitive impairment,” “dementia,” and “delirium.” By synthesizing data from this diverse body of literature, the study aimed to provide a nuanced evaluation and comparison of these two cognitive assessment instruments.

General Practitioner Assessment of Cognition

The General Practitioner Assessment of Cognition (GPCOG) is a cognitive screening instrument explicitly designed for utilization within primary care settings, with a particular focus on its application by general practitioners (Brodaty et al., 2004; Park & Kim, 2010; Brodaty et al., 2006; Wojtowicz & Larner, 2016; Brodaty & Pond, 2005; Tsai et al., 2023; Gee et al., 2013). GPCOG is composed of two fundamental components: the GPCOG-patient examination (max 9 points; below 9 points, it is necessary to conduct an interview with a close person—step 2 of the questionnaire; in addition, a result of 0–5 points in this part already indicates cognitive disorders) and the GPCOG-informant interview (max 6 points; a score of 0–3 points indicates cognitive disorders). The GPCOG-patient evaluates various cognitive functions, including time orientation, visuospatial skills (assessed through a clock-drawing test), episodic memory (based on the ability to report a recent news event), and delayed recall (evaluated through a name and address recall task). The GPCOG-informant, on the other hand, assesses the patient's daily functioning by inquiring about their memory of recent conversations, ability to manage money and medications, word-finding difficulties, and the need for travel assistance (Brodaty et al., 2004; Wojtowicz & Larner, 2015; Gostyńska & Ostrowska, 2018; Brodaty et al., 2002; Brodaty et al., 2016; Range, 2023; Machin et al., 2023).

The GPCOG-patient scores exhibited correlations with age (Tsang, 2015), education, and depression scores, but only age remained a significant factor in regression analysis. Notably, the GPCOG-informant section demonstrated impartiality without bias (Brodaty et al., 2004; Sze et al., 2015).

The study (Patil, 2019) conducted rapid preliminary cognitive screening using the General Practitioner Assessment of Cognition (GPCOG) alongside other standard tests, revealing a

notable prevalence of cognitive impairment among geriatric patients in busy outpatient settings, emphasizing the efficiency and effectiveness of GPCOG as a tool for early detection of cognitive issues (Brodaty, 2003; Brodaty et al., 2016; Brodaty & Pond, 2005). The General Practitioner Assessment of Cognition (GPCOG) demonstrates utility beyond cognitive screening, extending to postoperative cognitive function evaluation and monitoring therapeutic outcomes, such as those related to pharmacological interventions for conditions like hypertension (Smith et al., 2013; Skybchyk & Pylypiv, 2020).

The study evaluated the Chinese version of the General Practitioner Assessment of Cognition (GPCOG-C) as a dementia-screening tool, affirming its effectiveness and reliability comparable to the original English version and other language adaptations. GPCOG-C demonstrated high sensitivity (97%) and specificity (89%) in detecting dementia, outperforming previous studies possibly due to the involvement of trained psychogeriatricians and a higher prevalence of dementia among participants. Its diagnostic performance was similar to widely used tests like MMSE and HDS, with an area under the curve (AUC) of 0.97. The GPCOG-C showed a high negative predictive value (99%) and positive predictive value (72%), emphasizing its role in ruling out dementia while signaling the need for further assessment in positive cases. Incorporating informant interviews enhanced specificity and positive predictive value, reducing false positives, and administration time could be significantly shortened using a sequential two-stage method, making GPCOG-C a practical and efficient screening tool for both patients and clinicians (Brodaty et al., 2004; Brodaty et al., 2002; Li et al., 2013; Seeher & Brodaty, 2017).

Studies have shown that GPCOG demonstrates diagnostic accuracy similar to that of the Mini-Mental State Examination (MMSE) and provides comparable positive and negative predictive values (PPV/NPV). Adjusted cut-off points for GPCOG exhibit high sensitivity (86%) and satisfactory specificity (65%–80%), making it suitable for identifying cognitive impairments (Yokomizo et al., 2018).

The study validated the Italian version of the General Practitioner Assessment of Cognition (GPCOG-It) as an efficient dementia-screening tool for Italian general practitioners (GPs), demonstrating comparable performance to the Mini-Mental State Examination (MMSE) with high sensitivity (82%), specificity (92%), and positive predictive value (95%), along with quick administration times for both patient and informant interviews (Pirani et al., 2010).

Another study has compared the characteristics of the General Practitioner Assessment of Cognition (GPCOG) and the Mini-Mental State Examination (MMSE) in detecting likely dementia, using the Cambridge Cognitive Examination (CAMCOG) as a reference. Both the GPCOG and MMSE demonstrated similar performance against the CAMCOG, with no significant difference in their Area Under the Curve (AUC) values. The GPCOG showed higher sensitivity (79%) but lower specificity (92%) compared to the MMSE when using established cutpoints.

There is also a French version of GPCOG in a psychogeriatric population, revealing high sensitivity (96%), specificity (62%), positive predictive value (83%), and negative predictive value (90%) for dementia diagnosis, suggesting its accuracy and acceptance as a dementia-screening tool in primary care, comparable to the English version and usable by non-specialized carers (Thomas et al., 2006).

Despite the GPCOG's shorter administration time, it performed similarly to the MMSE, suggesting its potential as a triage test for identifying cases requiring further investigation. The study highlighted the importance of the scoring method for the GPCOG, with the two-stage algorithm showing slightly higher misclassification but offering practical utility in initial screening. The findings support the clinical efficacy of GPCOG, providing a viable alternative for dementia screening in primary care settings. Despite these limitations, the study confirms the GPCOG's clinical utility, especially in situations where MMSE administration time is impractical in primary care (Brodaty et al., 2016; Hunt et al., 2017).

The other study (Brodaty et al., 2002) validated the General Practitioner Assessment of Cognition (GPCOG) as an efficient dementia-screening tool in primary care, with a sensitivity of 85%, specificity of 86%, a misclassification rate of 14%, and a positive predictive value of 71.4%, demonstrating its reliability and effectiveness compared to other assessments like the Abbreviated Mental Test (AMT) and possibly the Mini-Mental State Examination (MMSE), while also being quick to administer and receiving positive feedback from both practitioners and patients.

In contrast, the Chinese study aimed to evaluate the effectiveness of GPCOG in screening for mild cognitive impairment (MCI) among elderly individuals in the community. The GPCOG Chinese version demonstrated significant differences in scores between individuals with MCI and normal cognitive function, highlighting its potential as a preliminary screening tool for MCI in the elderly population. The GPCOG Chinese version scores were significantly

correlated with MMSE and MoCA-B scores in both groups, with correlation coefficients of 0.807 and 0.866, respectively, and $P<0.01$ for both. The AUC for GPCOG total scores in distinguishing between the two groups was 0.954, with a sensitivity of 86.6% and specificity of 89.1% (Zhang et al., 2021).

The study by Basic et al. (2009) compared the diagnostic accuracy of the GPCOG with the MMSE and RUDAS in older individuals from culturally and linguistically diverse backgrounds, finding that while all three instruments were equally accurate in predicting dementia, the GPCOG showed superior performance in ruling out dementia, highlighting its efficacy as a combined participant and informant measure in such populations (Basic et al., 2009).

The advantages of the GPCOG include its brevity, taking only 4–6 minutes to administer, its cost-effectiveness, and minimal cultural, language, and educational bias (Yokomizo et al., 2018). Its reliability is high for the patient section and satisfactory for the informant section. Moreover, it performs at least as well as the MMSE but with a shorter administration time. The GPCOG has been adapted and studied in different languages and sociocultural contexts, consistently demonstrating similar psychometric properties to the original version. It has shown advantages in ruling out dementia compared to other assessment scales (Brodaty et al., 2016).

Nonetheless, the GPCOG is not without its limitations. There is a need for further research on whether including additional cognitive tasks can improve specificity. The GPCOG is still a screening tool and not a diagnostic test, so a definitive diagnosis of cognitive disorders requires further evaluation. In addition, it might not effectively identify subtle cognitive changes in the early stages of neurodegenerative diseases (Brodaty et al., 2004).

Another issue arose from scoring errors, which were quite common when employing the General Practitioner Assessment of Cognition (GPCOG) in primary care settings, emphasizing challenges associated with its patient and informant components (Wojtowicz & Larner, 2016). The use of GPCOG is becoming more common in primary care, but proper training in its administration and scoring may be necessary to ensure that it provides valuable information. In one of the studies, during a 6-month observation period (January–June 2015), 41.3% of patients underwent cognitive screening before referral, with 11.6% specifically administered the GPCOG. However, concerns were raised as GPCOG was found to be incorrectly used or documented in 29% of cases. These findings emphasize the imperative of

proper training to address issues related to the accurate administration of GPCOG and ensure meaningful information retrieval in primary care settings (Wojtowicz & Larner, 2015).

Lastly, its cultural and educational bias, though minimal, should be considered (Yokomizo et al., 2018; Rashedi et al., 2019; Ionova et al., 2022; Griffiths et al., 2015; Sit et al., 2015). The study by Yokomizo et al. (2018) describes the validation of the Brazilian version of the General Practitioner Assessment of Cognition (GPCOG-Br) as a screening tool for cognitive impairment, particularly dementia, in primary care. Among 119 participants, 26 were excluded, and the remaining 93 were divided into cases (with cognitive impairment) and controls. GPCOG-Br showed similar diagnostic accuracy to the Mini-Mental State Examination (MMSE), with high sensitivity but low specificity using original cut points. Adjusted cut points improved specificity while maintaining good sensitivity. The study suggests training community health workers to use GPCOG-Br for dementia detection in primary care settings, especially in regions with low education levels. Further research with larger and more diverse samples is recommended to validate the findings and establish appropriate cut points for different populations (Yokomizo et al., 2018).

Addenbrooke's Cognitive Examination

The Addenbrooke's Cognitive Examination (ACE) is a complex neuropsychological test used to assess cognitive dysfunction in patients. In its original version, it was developed by Hodges in 1991, and over the years, subsequent modifications of the test have been published—the ACE-R in 2005 and the most current version, the ACE-III, in 2012. The primary goal and broadest application of the ACE test is the detection and differentiation of dementia in Alzheimer's disease and frontotemporal dementia, as well as progressive supranuclear palsy (Velayudhan et al., 2014). This is particularly important in the context of the increasing number of patients suffering from such conditions and the difficulties physicians face in differentiating between them.

The ACE-III test assesses a patient's cognitive functions across five domains: attention/orientation, memory, verbal fluency, language, and visuospatial functions. The maximum possible score is 100 points, with two standard cutoff points—88 and 82. A score greater than or equal to 88 indicates normal cognitive function, while a score below 82 suggests cognitive impairment. Scores falling within the range of 82–87 are considered inconclusive. Additionally, studies have reported a cutoff point of 61, which is particularly

sensitive for distinguishing between mild and moderate dementia (Bruno & Schurmann Vignaga, 2019). With the standard cutoff points of 82 and 88, the ACE-III demonstrates high sensitivity (93% and 100%, respectively) and specificity (100% and 96%) in diagnosing cognitive impairment (Hsieh et al., 2013).

Thus, it serves as a significant and reliable tool to aid in the clinical assessment of patients with various types of dementia. The structure of the test allows for the separate evaluation of individual cognitive domains, which is a crucial advantage in differentiating dementia in Alzheimer's disease (DAT) and frontotemporal dementia (FTD). In DAT, lower scores are observed in the domains of orientation, attention, and memory, whereas in FTD, lower scores are observed in the categories of verbal fluency and language, with memory being less affected. When these diseases are suspected, the ACE-III test can expedite a definitive diagnosis; however, it should be remembered that it plays only an auxiliary role and should always be corroborated with the patient's medical history, neuroimaging, and laboratory results (Bruno & Schurmann Vignaga, 2019; Elamin et al., 2016; Beishon et al., 2019).

It has also been reported that the ACE-III is effective in detecting early-onset dementia (EOD) and mild cognitive impairment (MCI) (Bruno & Schurmann Vignaga, 2019). The test differentiates between patients suffering from EOD and healthy individuals with high sensitivity and specificity. Proper diagnosis of EOD allows for the timely implementation of symptomatic therapy, establishes a prognosis for the disease course and patient survival, and reduces the number of unnecessary tests ordered during the diagnostic process (Elamin et al., 2016).

The utility of the ACE-III has been extensively evaluated and validated in numerous studies (Velayudhan et al., 2014; Hsieh et al., 2013; Elamin et al., 2016; Beishon et al., 2019), both in primary and specialty care settings. However, there are limitations to its effectiveness, particularly in detecting the behavioral variant of frontotemporal dementia (bvFTD). This limitation arises because the cognitive domains assessed by the ACE-III may remain intact during the early stages of bvFTD. At this stage, symptoms predominantly involve executive functions, which the ACE-III evaluates only within the verbal fluency category. Consequently, this creates a substantial gap in obtaining comprehensive information about higher brain functions using this test. Therefore, it is important to remember that the ACE-III serves only as an auxiliary tool for diagnosing a patient’s condition and monitoring disease progression (Elamin et al., 2016).

Table 1. Comparison of Cognitive Assessment Tools: ACE – III and CPCOG

CRITERIA	ACE – III	CPCOG
Purpose of use	Complex neuropsychological test. Important in detecting Alzheimer's disease, frontal dementia, progressive supranuclear palsy	Screening test used to assess cognitive disorders. Particularly important in evaluating the occurrence of MCI (mild cognitive impairment) and dementia.
Methodology	Assessment of the patient's cognitive functions in the following categories: 1) Attention/orientation 2) Memory 3) Verbal fluency 4) Language 5) Visuospatial functions	A more complex test consisting of: The patient's GPCOG examination, which includes: Recall test, questions about time orientation and recent events, clock drawing test, GPCOG information sheet conducted with a close person: Interview consisting of 6 questions asked to a close person

Interpretation	Max 100 points A score of >=88 indicates normal cognitive function A score of 82-87 remains inconclusive A score of <82 points indicates impaired cognitive function *61 points is the cut-off point for differentiating mild and moderate dementia	STEP 1 patient examination - max 9 points = no cognitive disorders, further tests are not necessary 5-8 points more information needed, interview a close person (STEP 2) 0-5 points indicate cognitive disorders - further tests are required STEP 2 max 6 points a result of 0-3 points indicates cognitive disorders - further tests are necessary
Sensitivity	93% for a cut-off point of 82 100% for a cut-off point of 88 In diagnosing cognitive disorders	79% in detecting probable dementia 86.6% in detecting mild cognitive impairment MCI
Specifity	100% for a cut-off point of 82 96% for a cut-off point of 88 In diagnosing cognitive disorders	92% in detecting probable dementia 89.1% in detecting mild cognitive impairment MCI

Pros	Very high reliability (high values of both sensitivity and specificity of the test). The structure of the test allows for the assessment of individual cognitive functions of the patient separately, The usefulness of ACE has been repeatedly confirmed and validated in various studies.	low cost, Speed (4-6 minutes) minimal impact of cultural and linguistic differences, and a small impact of education on test results. Sensitivity and specificity comparable to MMSE with significantly shorter execution time and lower level of complexity
Limitations	Limited ability of the test to assess early impairments in some cognitive domains Limited ability to assess executive functions, as the only executive functions assessed are those in the verbal fluency category	This is a screening tool and diagnoses cannot be made based on the results of this test. Some studies have shown incorrect use of the test, which indicates that its use requires training. It may not identify subtle changes in cognitive function in the early stages of some diseases.

Situations of particular usefulness of the test	Diagnosis and differentiation of Alzheimer's disease and frontotemporal dementia Detection of early onset dementia (EOD) Detection of mild cognitive impairment (MCI)	Screening assessment for dementia and mild cognitive impairment.
Situations of limited test usability	Detection of behavioral variant frontotemporal dementia (bvFTD)	Little utility in early stages of neurodegenerative diseases.

Conclusion

The General Practitioner Assessment of Cognition (GPCOG) is an efficient and practical cognitive screening tool for primary care, designed to assess cognitive performance through a two-component structure. The first component evaluates cognitive functions such as time orientation, visuospatial abilities (via a clock-drawing test), and memory (using recall tasks). If the patient scores below 9 points, an informant interview is conducted, assessing daily functioning such as memory for conversations and medication management. This dual approach ensures both cognitive abilities and functional capacity are examined, making it valuable in early detection of cognitive disorders in geriatric populations (Brodaty et al., 2004; Brodaty & Pond, 2005; Tsai et al., 2023).

The GPCOG has demonstrated versatility in various settings, including dementia screening, postoperative cognitive decline, and monitoring therapeutic interventions, such as those for

hypertension (Smith et al., 2013; Skybchyk & Pylypiv, 2020). Its validity is supported by studies showing high sensitivity and specificity, with a negative predictive value of 99% and a positive predictive value of 72%, aiding in ruling out dementia and prompting further assessment (Brodaty et al., 2002; Li et al., 2013). Its reliability across diverse cultural contexts is comparable to the Mini-Mental State Examination (MMSE), particularly in primary care settings where time is limited (Brodaty et al., 2016).

However, the GPCOG has limitations, including potential scoring biases, especially in culturally diverse populations, and the need for proper training to avoid errors (Yokomizo et al., 2018; Wojtowicz & Larner, 2016). While effective in ruling out dementia, it may be less sensitive to subtle early-stage cognitive changes (Brodaty et al., 2004). Therefore, it should be used as part of a broader diagnostic strategy, not as the sole diagnostic tool (Brodaty et al., 2006; Brodaty & Pond, 2005).

In contrast, the Addenbrooke's Cognitive Examination-III (ACE-III) offers a more detailed evaluation of five cognitive domains: attention, memory, verbal fluency, language, and visuospatial abilities. It excels in diagnosing conditions such as Alzheimer's disease, frontotemporal dementia, and progressive supranuclear palsy, offering high sensitivity (93-100%) and specificity (96-100%) at standard cutoffs. However, its complexity and need for specialized training make it less practical for routine screening, particularly in primary care settings (Velayudhan et al., 2014; Bruno & Schurmann Vignaga, 2019; Hsieh et al., 2013).

While the ACE-III provides an in-depth cognitive assessment, it may miss early behavioral variant frontotemporal dementia (bvFTD), which primarily affects executive functions, an area less comprehensively evaluated by the ACE-III (Elamin et al., 2016). Thus, its use should always complement other diagnostic tools, such as neuroimaging and patient history, to create a complete clinical picture (Elamin et al., 2016; Beishon et al., 2019).

In summary, both the GPCOG and ACE-III are valuable tools in cognitive assessment. The GPCOG excels in quick, efficient screening, especially in primary care, while the ACE-III provides a more detailed and specific assessment for diagnosing dementia, particularly in specialty care. Together, they offer complementary strengths, supporting a comprehensive approach to cognitive health in aging populations (Bruno & Schurmann Vignaga, 2019; Hsieh et al., 2013).

Disclosure:

Author Contributions:

Conceptualization: Dominik Sikora, Piotr Oleksy, and Magdalena Mąka

Methodology: Bartosz Buczkowski, Karol Zieliński, and Łukasz Papież

Validation: Adam Zając, Bartosz Buczkowski, and Jakub Kamiński

Formal Analysis: Jakub Kamiński, Magdalena Mąka, and Ewa Góralczyk

Investigation: Łukasz Papież, Magdalena Mąka, and Dominik Sikora

Resources: Jakub Kamiński, Karol Zieliński, and Ewa Góralczyk

Data Curation: Dominik Sikora, Adam Zając, and Piotr Oleksy

Writing – Original Draft Preparation: Piotr Oleksy, Karol Zieliński, and Dominik Sikora

Writing – Review & Editing: Ewa Góralczyk, Łukasz Papież, and Piotr Oleksy

Visualization: Adam Zając, Ewa Góralczyk, and Karol Zieliński

Supervision: Piotr Oleksy, Dominik Sikora, and Bartosz Buczkowski

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References:

Velayudhan, L., Ryu, S. H., Raczek, M., Philpot, M., Lindesay, J., Critchfield, M., & Livingston, G. (2014). Review of brief cognitive tests for patients with suspected dementia. International psychogeriatrics, 26(8), 1247-1262.

Bruno, D., & Schurmann Vignaga, S. (2019). Addenbrooke's cognitive examination III in the diagnosis of dementia: a critical review. Neuropsychiatric disease and treatment, 441-447.

Hsieh, S., Schubert, S., Hoon, C., Mioshi, E., & Hodges, J. R. (2013). Validation of the Addenbrooke's Cognitive Examination III in frontotemporal dementia and Alzheimer's disease. Dementia and geriatric cognitive disorders, 36(3-4), 242-250.

Elamin, M., Holloway, G., Bak, T. H., & Pal, S. (2016). The utility of the Addenbrooke's cognitive examination version three in early-onset dementia. Dementia and Geriatric Cognitive Disorders, 41(1-2), 9-15.

Beishon, L. C., Batterham, A. P., Quinn, T. J., Nelson, C. P., Panerai, R. B., Robinson, T., & Haunton, V. J. (2019). Addenbrooke's Cognitive Examination III (ACE-III) and mini-ACE for the detection of dementia and mild cognitive impairment. Cochrane Database of Systematic Reviews, (12).

Brodaty, Henry, Nicola M. Kemp, and Lee-Fay Low. "Characteristics of the GPCOG, a screening tool for cognitive impairment." International journal of geriatric psychiatry 19.9 (2004): 870-874.

Wojtowicz, Alex, and A. J. Larner. "General Practitioner Assessment of Cognition: use in primary care prior to memory clinic referral." Neurodegenerative Disease Management 5.6 (2015): 505-510.

Brodaty, Henry, et al. "Screening for dementia in primary care: a comparison of the GPCOG and the MMSE." Dementia and geriatric cognitive disorders 42.5-6 (2016): 323-330.

Yokomizo, Juliana Emy, et al. "Cognitive screening test in primary care: cut points for low education." Revista de saude publica 52 (2018).

Zhang Hui, et al. "Application of the Chinese version of GPCOG in screening for mild cognitive impairment in community-dwelling elderly people." Journal of Tongji University (Medical Edition) 42.2 (2021): 220-225.

Gostyńska, Agnieszka, and Barbara Ostrowska. "Detection of Cognitive Impairments in Elderly Patients in Primary Care Settings." Neuropsychiatry & Neuropsychology/Neuropsychiatria i Neuropsychologia 13.3 (2018).

Brodaty, Henry, et al. "The GPCOG: a new screening test for dementia designed for general practice." Journal of the American Geriatrics Society 50.3 (2002): 530-534.

Pirani, Alessandro, et al. "The validation of the Italian version of the GPCOG (GPCOG-It): a contribution to cross-national implementation of a screening test for dementia in general practice." International Psychogeriatrics 22.1 (2010): 82-90.

Hunt, Harriet A., et al. "The comparative diagnostic accuracy of the Mini Mental State Examination (MMSE) and the General Practitioner assessment of Cognition (GPCOG) for identifying dementia in primary care: a systematic review protocol." Diagnostic and prognostic research 1 (2017): 1-6.

Li, Xia, et al. "Validation of the general practitioner assessment of cognition–Chinese version (GPCOG-C) in China." International psychogeriatrics 25.10 (2013): 1649-1657.

Seeher, Katrin M., and Henry Brodaty. "The general practitioner assessment of cognition (GPCOG)." Cognitive Screening Instruments: A Practical Approach (2017): 231-239.

Thomas, Philippe, et al. "The GPcog for detecting a population with a high risk of dementia." Psychologie & neuropsychiatrie du vieillissement 4.1 (2006): 69-77.

Rashedi, Vahid, et al. "Validity and reliability of the Persian version of general practitioner assessment of cognition (P-GPCOG)." Aging & mental health 23.8 (2019): 961-965.

Park, Jee-Won, and Yong-Soon Kim. "Validation of the Korean version of the general practitioner assessment of cognition (K-GPCog)." The Korean Journal of Rehabilitation Nursing 13.1 (2010): 5-12.

Ionova, T. I., et al. "The use of the Mini-Cog, MMSE, and GPCOG tests in domestic clinical practice for the evaluation of cognitive disorders in elderly and senile patients: the results of a survey of experts' opinions." Zhurnal Nevrologii i Psikhiatrii imeni SS Korsakova 123.7 (2023): 55-64.

Ionova, T. I., et al. "Linguistic and cultural adaptation of the Russian version of general practitioner assessment of cognition questionnaire-GPCOG in elderly and senile patients at the primary care level." Zhurnal Nevrologii i Psikhiatrii Imeni SS Korsakova 122.12 (2022): 117-127.

RANGE, AGE. "GENERAL PRACTITIONER ASSESSMENT OF COGNITION (GPCOG)| 233 GENERAL PRACTITIONER ASSESSMENT OF COGNITION (GPCOG)." A Compendium of Neuropsychological Tests: Fundamentals of Neuropsychological Assessment and Test Reviews for Clinical Practice (2023): 233.

Machin, Abdulloh, et al. "Comparison of Cognitive Function in Covid-19 Survivors Treated in the Icu and Non-Icu by Assessment of Gpcog Score." Available at SSRN 4645334.

Patil, Mahesh Shrikishan. "Comparative Study of 3 Tests of Cognitive Impairment (MMSE, AD-8, GPCOG) in 200 Suspected Geriatric Cases Out of 3750 Screened for Cognitive Impairment." Journal of the Indian Academy of Geriatrics 15.4 (2019).

Brodaty, Henry. "PB-019 The GPCOG: A Screening Test for Dementia for Use in Primary Care." The Eleventh International Congress. 2003.

Brodaty, H., et al. "General Practitioner Assessment of Cognition (GPCOG)." J. Am. Geriatr. Soc 50.3 (2016): 530-534.

Griffiths, J., S. Putthinoi, and M. Pongsuksri. "General practitioner assessment of cognition (Thai version) validity and reliability." Asian Journal of Gerontology and Geriatrics 10.1 (2015): 62-62.

Brodaty, Henry, et al. "What is the best dementia screening instrument for general practitioners to use?." The American Journal of Geriatric Psychiatry 14.5 (2006): 391-400.

Basic, David, et al. "Rowland Universal Dementia Assessment Scale, Mini-Mental State Examination and General Practitioner Assessment of Cognition in a multicultural cohort of community-dwelling older persons with early dementia." Australian Psychologist 44.1 (2009): 40-53.

Wojtowicz, Alex, and Andrew Larner. "Scoring errors in cognitive screening instruments administered in primary care." (2016): e1-e1.

Brodaty, Henry, and Dimity Pond. "[P-034]: The GPCOG: A new tool for primary care physicians to detect dementia." Alzheimer's & Dementia 1 (2005): S19-S19.

Tsai, Kang-Lin, Wolf Frances, and Elizabeth Suniega. "Dementia Screening at Hope Clinic." (2023).

Sit, L. M. K., et al. "PARO therapy for elderly with cognitive decline or dementia with behavioural and psychological symptoms in a Hong Kong geriatric day hospital: a preliminary evaluation." Asian Journal of Gerontology and Geriatrics 10.1 (2015): 62-63.

Sze, P. C., et al. "Development of an interactive functional screening tool for promoting healthy ageing in a primary healthcare setting in Hong Kong." Asian Journal of Gerontology and Geriatrics 10.1 (2015): 62-62.

Tsang, E. W. "Age-related effects on early visual attention." Asian Journal of Gerontology and Geriatrics 10.1 (2015): 62-62.

Gee, Erin, et al. "Evaluation of the General Practitioner Assessment of Cognition (GPCOG) in Paramedic Practice." (2013).

Smith, G., et al. "Cognitive Impairment in Elderly Patients Evaluated for Cardiac Surgery." Heart, Lung and Circulation 22.7 (2013): 579

Skybchyk, V. A., and O. S. Pylypiv. "Possibilities of antihypertensive therapy in correction of cognitive impairment in hypertensive patients." Journal of Education, Health and Sport 10.1 (2020): 150-157