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Authors

Jennings, Lee A
Araujo, Katy LB
Meng, Can
et al.

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Utility of a short, telephone-administered version of the Montreal Cognitive Assessment

Lee A. Jennings MD, MSHS¹   | Katy L. B. Araujo MPH² | Can Meng MS, MPH³ | Peter Peduzzi PhD³ | Peter Charpentier MPH² | David B. Reuben MD⁴

¹Reynolds Section of Geriatrics, Department of Medicine, University of Oklahoma Health Sciences Center, Oklahoma City, Oklahoma, USA

²Department of Internal Medicine, Yale School of Medicine, New Haven, Connecticut, USA

³Department of Biostatistics, Yale Center for Analytical Sciences, Yale School of Public Health, New Haven, Connecticut, USA

⁴Multicampus Program in Geriatric Medicine and Gerontology, David Geffen School of Medicine, Division of Geriatrics, University of California, Los Angeles, California, USA

Correspondence

Lee A. Jennings, Reynolds Section of Geriatrics, Department of Medicine, University of Oklahoma Health Sciences Center, 1122 N.E. 13 Street, ORB 1200, Oklahoma City, OK 73117, USA.
Email: lee-jennings@ouhsc.edu

David B. Reuben, Multicampus Program in Geriatric Medicine and Gerontology, Division of Geriatrics, David Geffen School of Medicine, University of California, 10945 Le Conte Ave., Suite 2339, Los Angeles, CA 90095-1687, USA.
Email: dreuben@mednet.ucla.edu

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Abstract

Background: Because of the COVID-19 pandemic, the ongoing D-CARE pragmatic trial of two models of dementia care management needed to transition to all data collection by telephone.

Methods: For the first 1069 D-CARE participants, we determined the feasibility of administering a short 3-item version of the Montreal Cognitive Assessment (MoCA) to persons with dementia by telephone and examined the correlation with the full 12-item version.

Results: The 3-item version could be administered by telephone in approximately 6 min and was highly correlated with the full MoCA ($r = 0.78$, $p < 0.0001$).

Conclusions: This brief version of the MoCA was feasible to collect by telephone and could be used as an alternative to the full MoCA, particularly if the purpose of cognitive assessment is characterization of study participants.

KEYWORDS

cognitive assessment, dementia, telephone administration

INTRODUCTION

The Montreal Cognitive Assessment (MoCA)¹ is a validated, widely used cognitive test that captures mild cognitive impairment and dementia. Telephone versions of the MoCA have been validated^{2,3} as have shorter in-person versions.⁴ Early in an ongoing pragmatic trial comparing two dementia care models,⁵ we noticed more

participants than expected had missing MoCA data. Almost simultaneously, the COVID-19 pandemic forced changes in the study protocol, including telephone collection of all data. These two circumstances prompted us to determine the feasibility of administering a short version of the MoCA to persons with dementia (PWD) by telephone and how well it correlated with the full MoCA administered in person.

TABLE 1 Comparison of full MoCA, telephone MoCA, and Dong MoCA

Cognitive domains and tasks	Full MoCA	Telephone MoCA	Dong MoCA
Visuospatial/executive (5 points)			
Alternate trail making	X		
Visuoconstructional skills (copy cube)	X		
Visuoconstructional skills (clock draw)	X		
Animal naming (3 points)	X		
Attention (6 points)			
Forward and backward digit span	X	X	
Vigilance (A-test)	X	X	
Serial subtraction by 7	X	X	
Language (3 points)			
Sentence repetition	X	X	
Verbal fluency (F words)	X	X	X
Abstraction (2 points)	X	X	
Delayed recall (5 points)	X	X	X
Orientation (6 points)	X	X	X
Total maximum points	30	22	12

Note: Full MoCA: in-person, 12-item, 30-point version.¹ Telephone MoCA: 8-item, 22-point version.^{2,8} Dong MoCA: 3-item, 12-point version.⁶ Abbreviation: MoCA, Montreal Cognitive Assessment.

Key Points

In a pragmatic trial, a 3-item version of the Montreal Cognitive Assessment (MoCA) was feasible to administer by telephone and highly correlated with the full MoCA.

Why Does this Paper Matter?

This brief version of the MoCA could be used for telephone cognitive assessment, particularly if the purpose is participant characterization.

METHODS

Data were from baseline assessments of the D-CARE study,⁵ approved by the UCLA IRB and all four trial sites (Clinicaltrials.gov Identifier NCT03786471). From June 2019 until March 2020, the MoCA was administered in person, and subsequently the study transitioned to telephone data collection of a shortened version validated by Dong et al.⁶ We selected this version because it required no visual tasks and the scoring rules matched the original MoCA. The full MoCA is a 12-item, 30-point instrument and the Dong version is a 3-item, 12-point subset

TABLE 2 Characteristics of participants

	Full sample, N = 1069	Participants with missing MoCA data, N = 267	Participants with Dong version only, N = 535	Participants who completed MoCA in person, N = 267	p-Value
Age, mean (SD)	80.5 (8.7)	81.5 (8.8)	79.9 (9.1)	80.8 (7.9)	0.038
Female, N (%)	641 (60.0)	153 (57.3)	325 (60.8)	163 (61.1)	0.590
White, non-Hispanic, N (%)	812 (76.0)	213 (79.8)	392 (73.3)	207 (77.5)	0.100
Medicare-Medicaid dually insured, N (%)	87 (8.1)	21 (7.9)	51 (9.5)	15 (5.6)	0.158
Caregiver relationship, N (%)					0.007
Spouse	492 (46.0)	116 (43.5)	227 (42.4)	149 (55.8)	
Child	472 (44.2)	122 (45.7)	252 (47.1)	98 (36.7)	
Other	105 (9.8)	29 (10.9)	56 (10.5)	20 (7.5)	
ADL dependencies, mean (SD)	4.3 (1.9)	3.9 (2.0)	4.3 (2.0)	4.8 (1.6)	<0.0001
Full MoCA score, mean (SD), N = 267	12.2 (5.7)	NA	NA	12.2 (5.7)	
Dong MoCA score, mean (SD), N = 802	3.6 (2.8)	NA	3.7 (3.1)	3.4 (2.2)	0.177

Note: Participants who completed the full in-person MoCA will also have a Dong MoCA score as the Dong version is a subset of the full MoCA. Baseline characteristics compared among participants with missing MoCA data, participants with Dong version only, and participants who completed MoCA in person using chi-square test for categorical variables and ANOVA for continuous variables. Scores for those with Dong version only and those who completed MoCA in person were compared using a pooled *t* test.

Abbreviations: ADL, activities of daily living including bathing, dressing, toileting, transferring (getting from bed to chair), continence, and feeding; ANOVA, analysis of variance; MoCA, Montreal Cognitive Assessment.

(i.e., verbal fluency, delayed recall, and orientation) (Table 1). Pearson's correlation coefficient and linear regression of the Dong subset score on the full MoCA total score were performed.

RESULTS

Among the first 1069 D-CARE participants, 267 had missing MoCA data (25%). Table 2 provides characteristics of participants with and without missing data, those who completed the full MoCA in person ($N = 267$), and those with the shortened Dong version completed by telephone or derived from a partial in-person MoCA ($N = 535$). Of those participants with missing MoCA data, 235 had all data missing and 32 had partial data missing due to refusal by PWD or caregiver ($N = 144$), hearing impairment ($N = 70$), PWD's inability to complete assessment ($N = 29$), or other ($N = 24$). Mean scores were 12.2 (SD 5.7) for the full MoCA and 3.6 (SD 2.8) for the Dong version. The correlation between full MoCA and Dong subset scores ($N = 267$ with both full and Dong scores) was 0.78 ($p < 0.0001$) and the adjusted R^2 was 0.60.

DISCUSSION

We found that the 3-item Dong MoCA is highly correlated with the full 12-item MoCA and can be administered by telephone to PWD in approximately 6 min. There are seven shortened, previously validated versions of the MoCA,⁴ including the one validated for telephone administration in persons with stroke using different scoring rules.⁷ One advantage of the Dong version is that it can be calculated from the full MoCA if individual items have been recorded. Therefore, studies that have previously collected in-person data prior to switching to telephone administration can include both modes of administration. Although the brevity of the Dong version helps reduce missing data, it is not as robust as the 22-point telephone version, or version for persons with visual impairment, which collects all items except those requiring a visual stimulus or use of paper and pencil.^{2,8} Accordingly, the purpose of cognitive assessment is important. If it is to characterize study participants, the abbreviated version may suffice. If it is an important outcome measure, then a longer telephone version may be preferable.

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CONFLICT OF INTEREST

The authors have no conflicts of interest to report.

AUTHOR CONTRIBUTIONS

Lee A. Jennings: conception and design, analysis and interpretation of data; drafting the article; revising the article critically for important intellectual content; final approval. Katy L. B. Araujo: conception and design, analysis and interpretation of data; revising the article critically for important intellectual content; final approval. Can Meng: analysis and interpretation of data; revising the article critically for important intellectual content; final approval. Peter Peduzzi: interpretation of data; revising the article critically for important intellectual content; final approval. Peter Charpentier: analysis and interpretation of data; revising the article critically for important intellectual content; final approval. David B. Reuben: conception and design; acquisition of data; analysis and interpretation of data; revising the article critically for important intellectual content; final approval.

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ORCID

Lee A. Jennings  <https://orcid.org/0000-0002-9524-6921>

TWITTER

Lee A. Jennings  @LeeAJennings

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