

Comparing a Brief Performance-Based Measure of Cognition and Daily Functioning in Unhoused and Housed Older Adults

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Abstract

Background: Cognitive impairment and dementia are disproportionately prevalent but under-diagnosed in unhoused older adults. Currently, assessments of cognition and daily functioning (e.g., Clinical Dementia Rating [CDR]) are time-intensive and require resources (e.g., home environment, reliable informant, trained clinician) that are not accessible/available to most unhoused individuals. However, we have developed an objective performance-based measure of cognition and daily functioning that can be collected in ~5 minutes outside of clinical or laboratory settings without expensive equipment or specialized training. This measure (the BEan, or Brief Evaluation of daily function) has been validated in stably-housed cohorts as a measure of cognition and daily functioning, as well as a prognostic indicator of how much cognitive and functional decline will occur over the following year. The purpose of this study was to evaluate the concurrent validity of the BEan in a cohort of unhoused older adults.

Methods: Scores from the MoCA and BEan, along with age, sex, and educational attainment (in years) were extracted from convenience samples of stably-housed older adults (n=317) and unhoused older adults recruited from a non-congregate homeless shelter (n=52). Generalized linear mixed models with gamma distribution were used to determine the association between BEan scores and MoCA scores within each sample, controlling for age, sex, and education.

Results: Consistent with prior work, BEan scores were significantly associated with MoCA scores in the housed sample ($\beta=-.035$; 95%CI [-.065, -.006]), with no significant effects of sex or education. In the unhoused sample, the relationship between BEan scores and MoCA scores was similar to the housed sample ($\beta=-.076$; 95%CI [-.13, -.026]), also with no significant effects of sex or education. Notably, the unhoused sample was significantly younger in terms of chronological age than the housed sample (63.3±5.6 vs. 78.1±8.6 years) and had lower educational attainment (12.9±2.3 vs. 15.9±1.3 years).

Conclusions: The strength of the relationship between the BEan and cognition (evaluated with the MoCA) was consistent across housed and unhoused older adults, demonstrating comparable concurrent validity. Furthermore, BEan scores remained resilient against demographic factors, in contrast to traditional cognitive screens. Thus, the BEan may be appropriate for evaluating diverse populations in varied settings.

Background

Cognitive impairment and dementia are disproportionately prevalent but under-diagnosed in unhoused older adults. We have previously shown that up to 90% of adults aged 55 and over in homeless shelters screen positive for mild cognitive impairment (MCI) or dementia using the Montreal Cognitive Assessment (MoCA). This finding suggests the need for an accessible assessment of cognition and daily functioning for older adults in homeless shelters to distinguish MCI and dementia from other conditions that may impair cognitive performance in this vulnerable population. However, gold standard assessments (e.g., Clinical Dementia Rating [CDR]) are time-intensive and require resources (e.g., home environment, reliable informant, trained clinician) that are not accessible/available to most unhoused older adults.

We have developed an objective performance-based measure of cognition and daily functioning that can be collected in ~5 minutes outside of clinical or laboratory settings without expensive equipment or specialized training, making it more feasible for administration in homeless shelters and other settings serving vulnerable older adults at risk for cognitive decline. This measure (the BEan, or Brief Evaluation of daily function) has been validated in stably-housed cohorts as a measure of cognition and daily functioning, as well as a prognostic indicator of how much cognitive and functional decline will occur over the following year.

The purpose of this study was to evaluate the concurrent validity of the BEan in a cohort of unhoused older adults staying in a non-congregate emergency homeless shelter.

Methods

Research activities were overseen by the Arizona State University Institutional Review Board.

After undergoing training to administer the MoCA and BEan tests, researchers obtained informed consent and administered the MoCA and BEan to older adults aged 55 and over including a convenience sample of stably-housed older adults (n=317) and unhoused older adults in a non-congregate emergency homeless shelter (n=52). The MoCA and BEan were administered in a single session for each participant.

Scores from the MoCA and BEan, along with age, sex, and educational attainment (in years) were extracted from study data. Generalized linear mixed models with gamma distribution were used to determine the association between BEan scores and MoCA scores within each sample, controlling for age, sex, and education.



Results

Consistent with prior work by Schaefer et al., BEan scores were significantly associated with MoCA scores in the housed sample ($\beta=-.035$; 95%CI [-.065, -.006]), with no significant effects of sex or education.

In the unhoused sample, there was a similar significant association between BEan scores and MoCA scores ($\beta=-.076$; 95%CI [-.13, -.026]), also with no significant effects of sex or education.

Notably, the unhoused sample was significantly younger in terms of chronological age than the housed sample (63.3±5.6 vs. 78.1±8.6 years) and had lower educational attainment (12.9±2.3 vs. 15.9±1.3 years).

Conclusion

The strength of the relationship between the BEan test of daily function and cognition (evaluated with the MoCA) was consistent across housed and unhoused older adults, demonstrating comparable concurrent validity. Furthermore, BEan scores remained resilient against demographic factors for both housed and unhoused groups, in contrast to traditional cognitive screens that require adjustment for demographic variables (e.g., lower educational attainment, lower socioeconomic status). These findings suggest that the BEan may be appropriate for evaluating diverse populations in varied settings, including vulnerable older adults in homeless shelters.

Additional research is needed to validate these findings in additional diverse samples including unsheltered homelessness. Future work is planned to assess the effectiveness of the BEan as a predictor of cognitive functional decline over time, along with the feasibility and acceptability of implementing the BEan as a routine screening tool in congregate and non-congregate homeless shelter settings.

References

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For more information

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