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Morehouse School of Medicine
Diversity Supplement Scholar
3P30AG031054-06S1
Personal Background

- Completed two-year Geriatric Medicine Fellowship at the University of Chicago
- Participated in the Deep South RCMAR Health Disparities Research Training Program
- Received a RCMAR pilot grant to study racial differences in outcomes for hospitalized older adults diagnosed with delirium
- Awarded RCMAR Diversity Supplement
Significance

- Cognitive difficulty without frank dementia affects an estimated 5.4 million ≥ 71 y/o

- By 2050
  - Non-European racial/ethnic minorities
    - Will make up nearly 50% of US population
    - 33% of all persons living with cognitive difficulty, including dementia
Introduction

• Many assessments of cognition are biased by education, cultural, ethnic and other factors.

• Thus, we need a better understanding of the implications of cognitive and functional assessments among racial, ethnic minorities.
“The prediction of functional capacity on the basis of cognitive test performance is an important aspect of neuropsychological assessment.”

Specific Aims

• Examine the association between cognition, measured by MMSE scores, and function, measured by BADL and IADL

• Examine potential racial and/or sex differences in the associations between cognition and function
UAB Study of Aging
1999-2001

Subjects were a stratified, random sample of Medicare beneficiaries living in 5 counties in central Alabama.

The study over-sampled males, African Americans, and rural residents.
Methods

Design

Cross-sectional study

Measurements

Function

Based on self-reported difficulty

Basic Activities of Daily Living (BADL)

Instrumental Activities of Daily Living (IADL)

Cognition

Mini-Mental State Exam (MMSE)

Analysis

Multivariable linear regression
BADL & IADL Difficulty

• For each activity, participants were asked if they had any difficulty doing the task

• A score of “0” was assigned if no difficulty

• If the participant indicated difficulty
  – Some difficulty= score of “1”
  – A lot of difficulty= score of “2”
  – Unable to perform the task= score of “3”

• Function scores ranged
  – BADL from 0-21
  – IADL from 0-18
Sample Description
N=974*

- Mean Age (SD) 75.2 (6.7)
- African-American 50%
- Female 50%
- Married 52%
- Household (3 or more) 17%
- Education < 9\textsuperscript{th} Grade 30%
- Income \leq $8000/year 23%

*26 participants who had a diagnosis of dementia were excluded
# Sample Description

N=974*

## Medical Conditions

<table>
<thead>
<tr>
<th>Condition</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hypertension</td>
<td>70.6%</td>
</tr>
<tr>
<td>Arthritis/ Gout</td>
<td>48.2%</td>
</tr>
<tr>
<td>Diabetes</td>
<td>25.2%</td>
</tr>
<tr>
<td>CAD</td>
<td>19.9%</td>
</tr>
<tr>
<td>COPD</td>
<td>13.6%</td>
</tr>
<tr>
<td>TIA/Stroke</td>
<td>10.8%</td>
</tr>
<tr>
<td>Hip Fracture</td>
<td>2.0%</td>
</tr>
</tbody>
</table>

*26 participants who had a diagnosis of dementia were excluded
Distribution of MMSE Scores by Race and Sex

<table>
<thead>
<tr>
<th></th>
<th>AAW n=238</th>
<th>AAM n=243</th>
<th>NHWW n=246</th>
<th>NHWM n=247</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;18 *</td>
<td>13.4</td>
<td>16.5</td>
<td>----</td>
<td>2.0</td>
</tr>
<tr>
<td>18-23</td>
<td>29.0</td>
<td>31.7</td>
<td>7.8</td>
<td>24.5</td>
</tr>
<tr>
<td>24-26</td>
<td>23.1</td>
<td>23.9</td>
<td>13.4</td>
<td>17.8</td>
</tr>
<tr>
<td>27-30 *</td>
<td>34.4</td>
<td>28.0</td>
<td>78.9</td>
<td>65.5</td>
</tr>
<tr>
<td>Mean Score (SD)</td>
<td>23.4 (5.2)</td>
<td>22.7 (5.4)</td>
<td>27.7 (2.6)</td>
<td>26.6 (3.5)</td>
</tr>
</tbody>
</table>

*Statistically significant differences
# BADL and IADL Scores by Race and Sex

<table>
<thead>
<tr>
<th>Race/Sex Subgroups</th>
<th>*BADL  Mean (SD) Score</th>
<th>**IADL  Mean (SD) Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>African American Women</td>
<td>2.1 (2.9)</td>
<td>2.6 (3.8)</td>
</tr>
<tr>
<td>African American Men</td>
<td>1.6 (3.2)</td>
<td>2.3 (3.9)</td>
</tr>
<tr>
<td>non-Hispanic White Women</td>
<td>1.4 (2.5)</td>
<td>1.9 (2.7)</td>
</tr>
<tr>
<td>non-Hispanic White Men</td>
<td>1.5 (2.7)</td>
<td>1.5 (2.6)</td>
</tr>
</tbody>
</table>

*BADL scores range from 0-21 where higher scores mean more difficulty

**IADL scores range from 0-18
Results- Independent associations between MMSE scores and BADL and IADL difficulty

<table>
<thead>
<tr>
<th>Participants</th>
<th>Unadjusted Analyses</th>
<th>Adjusted Analyses</th>
<th>Coefficient of Determination</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Unstandardized Beta</td>
<td>Standardized Beta</td>
<td>P-Value</td>
</tr>
<tr>
<td><strong>ADLs</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total group&lt;sup&gt;a&lt;/sup&gt;</td>
<td>0.064</td>
<td>0.093</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>African-American women&lt;sup&gt;b&lt;/sup&gt;</td>
<td>0.085</td>
<td>0.114</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>White women&lt;sup&gt;b&lt;/sup&gt;</td>
<td>0.054</td>
<td>0.088</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>African-American men&lt;sup&gt;b&lt;/sup&gt;</td>
<td>0.064</td>
<td>0.090</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>White men&lt;sup&gt;b&lt;/sup&gt;</td>
<td>0.054</td>
<td>0.083</td>
<td>&lt;.001</td>
</tr>
<tr>
<td><strong>IADL</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total group&lt;sup&gt;a&lt;/sup&gt;</td>
<td>0.079</td>
<td>0.098</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>African-American women&lt;sup&gt;b&lt;/sup&gt;</td>
<td>0.107</td>
<td>0.112</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>White women&lt;sup&gt;b&lt;/sup&gt;</td>
<td>0.073</td>
<td>0.102</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>African-American men&lt;sup&gt;b&lt;/sup&gt;</td>
<td>0.087</td>
<td>0.099</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>White men&lt;sup&gt;b&lt;/sup&gt;</td>
<td>0.053</td>
<td>0.086</td>
<td>&lt;.001</td>
</tr>
</tbody>
</table>

<sup>a</sup> Coefficients adjusted for age, race, sex, education, income, marital status, number in household, and comorbidity count.
<sup>b</sup> Coefficients adjusted for age, education, income, marital status, number in household, and comorbidity count.
The multivariable, adjusted model indicates the following:

1) the correlations between MMSE score and BADL or IADL difficulty were no longer significant in the total group after adjusting for demographic variables and number of comorbidities

2) The race and sex subgroup analysis suggested that this was true for all race and sex groups
Conclusions

- In community-dwelling older adults, cognition as measured using the MMSE was not independently correlated with self-reported day-to-day function in African-American or non-Hispanic white women and men.

- Socio-demographic and health variables explained associations between cognition and function.
Conclusions

- Women reported more difficulty with mobility-related daily function than men.

- African American women, in particular, reported more BADL and IADL difficulty with mobility-related daily function than any other race or sex group.
Implications

- Mirror those in the WHAS (Leveille et al., 1998) and the WHIMS (Atkinson et al., 2010)

- Sociodemographic factors and health status largely mediate observed relationships between cognitive and functional status in older adults.

Racial and Sex Differences in Associations Between Activities of Daily Living and Cognition in Community-Dwelling Older Adults

Stephanie L. Garrett, MD, Patricia Sawyer, PhD, Richard E. Kennedy, MD, PhD, Dawn McGuire, MDiv, MD, Roger P. Simon, MD, Harry S. Strothers, III, MD, MMM, and Richard M. Allman, MD

OBJECTIVES: To examine the association between function measured according to activities of daily living (ADLs), instrumental activities of daily living (IADLs), and cognition assessed according to Mini-Mental State Examination (MMSE) scores of older African-American and non-Hispanic white community-dwelling men and women.

DESIGN: Cross-sectional study assessing associations between self-reported ADL and IADL difficulty and MMSE scores for race- and sex-specific groups.

SETTING: Homes of community-dwelling older adults.

PARTICIPANTS: A random sample of 974 African-American and non-Hispanic white Medicare beneficiaries aged 65 and older living in west-central Alabama and participating in the University of Alabama at Birmingham.

RESULTS: Mini-Mental State Examination scores were modestly correlated with ADL and IADL difficulty in all four race- and sex-specific groups, with Pearson correlation coefficients ranging from −0.189 for non-Hispanic white women to −0.429 for African-American men. Correlations between MMSE and ADL or IADL difficulty in any of the race- and sex-specific groups were no longer significant after controlling for sociodemographic factors and comorbidities.

CONCLUSION: Mini-Mental State Examination was not significantly associated with functional difficulty in older African-American and non-Hispanic white men and women after adjusting for sociodemographic factors and comorbidities, suggesting a mediating role in the relationship between cognition and function. J Am Geriatr Soc 2013.
Future Direction

• Investigate other cognitive assessment methods and their associations with day-to-day function among diverse older adults

• To conduct prospective analyses in the association between cognition and day-to-day function
Mentors / Collaborators

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Patricia Sawyer, PhD
Richard E. Kennedy, MD PhD
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George Rust, MD, MPH
Roger P. Simon, MD
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