Alzheimer’s Care via Telemedicine for Oregon (ACT-ON), Phase I: Establishing the Feasibility and Reliability of Telemedicine-based Measures

NIA - Layton Aging and Alzheimer’s Disease Center
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July 2016

ACKNOWLEDGEMENTS: NIA P30 -AG008017and the Oregon Health Authority; Oregon Office of Rural Health
Background
Alzheimer’s Care via Telemedicine for Oregon (ACT-ON)

• Phase 1: Establish reliability of measures commonly used in dementia evaluations.
• Phase 2: Assess the feasibility of standard clinical visits when done via telemedicine.
• Funded by the Oregon Health Authority, Administered by the Office of Rural Health.
2002 Saligari, MMSE, GDS
2004, 2007 Loh, MMSE, GDS
2009 Ciemens, MMSE
2013 Parikh, MMSE
2014, Cullum, MMSE
2014 Abdolahi, MOCA
1993 Ball MMSE
1999 Ball, MMSE
2013 Timpano, MMSE
2000 Lee, CDR, MMSE

- 2002 Saligari, MMSE, GDS
- 2004, 2007 Loh, MMSE, GDS
Methods

AIMS
Assess the inter-site correlation of assessment measures for persons with Alzheimer’s Disease and their caregivers.

DESIGN
• 28 dyads completed an identical battery of tests—both in the clinic setting and via direct-to-home telemedicine, approximately 2 weeks apart
• Participants randomized to in-clinic or telemedicine initial visit
• Raters blinded to previous visit results
MEASURES

For Persons with AD

• The Montreal Cognitive Assessment (MoCA)
• Clinical Dementia Rating Scale (caregiver component) (CDR)
• Revised Memory and Behavior Problems Checklist (RMBPC; number of behaviors)
• Geriatric Depression Screen (GDS)

For Caregivers

• The Zarit Burden Interview (ZBI)
• Marwit Meuser Caregiver Grief Index (MMCGI)
• RMBPC (reaction to behaviors)
Methods

MoCA

- 30-point cognitive assessment, measures visuospatial abilities, executive function, verbal learning and memory, attention, concentration, language and orientation (Nasreddine et al., 2005).
- Mailed visuospatial/executive section to dyads, 1 page for each item (trail, cube, clock)
- Animals shown on a screen
- Clapping
## Methods

<table>
<thead>
<tr>
<th>Persons with AD</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Telemedicine</td>
<td>In-Clinic</td>
</tr>
<tr>
<td>MoCA (modified)</td>
<td>MoCA (modified)</td>
</tr>
<tr>
<td>GDS</td>
<td>GDS</td>
</tr>
<tr>
<td>CDR (caregiver component)</td>
<td>CDR (caregiver component)</td>
</tr>
<tr>
<td>RMBPC (behavior occurrence)</td>
<td>RMBPC (behavior occurrence)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Caregivers</th>
<th></th>
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<tbody>
<tr>
<td>Telemedicine</td>
<td>In-Clinic</td>
</tr>
<tr>
<td>ZBI</td>
<td>ZBI</td>
</tr>
<tr>
<td>RMBPC (reaction to behaviors)</td>
<td>RMBPC (reaction to behaviors)</td>
</tr>
<tr>
<td>MMCGI-SF</td>
<td>MMCGI-SF</td>
</tr>
</tbody>
</table>

### ANALYSIS

Test-retest reliability was measured by intraclass correlation coefficient (ICC) for continuous variables and the Kappa (K) statistic for categorical variables.
Results - Demographics

Table 1: Demographics, ACT-ON, Phase I (n=28 Dyads)

<table>
<thead>
<tr>
<th>Category</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Caregivers (% female)</td>
<td>61%</td>
</tr>
<tr>
<td>Persons with AD (% female)</td>
<td>61%</td>
</tr>
<tr>
<td>Age, Caregivers (mean, range)</td>
<td>65.3 (38-79)</td>
</tr>
<tr>
<td>Age, Person with AD (mean, range)</td>
<td>71.6 (51-96)</td>
</tr>
<tr>
<td>Hours/week caregiving (mean, range)</td>
<td>75.4 (0-168)</td>
</tr>
<tr>
<td>Years with AD diagnosis (mean, range)</td>
<td>3.3 (0-15)</td>
</tr>
<tr>
<td>Distance from clinic (% &gt; 10 miles)</td>
<td>75%</td>
</tr>
</tbody>
</table>
Results - Feasibility

• 33 dyads consented, 5 dropped out
• Of the 28 dyads that completed the visits, four patients (14%) were unable to complete the telemedicine MoCA
• All 28 caregivers completed the in-clinic and telemedicine batteries.
• Mean administration time, in-clinic visits: 41.4 minutes (SD=13)
• Mean administration time, telemedicine: 47.5 minutes (SD=12.6)

“It’s [computer screen] has just got to be plain and simple and it didn’t tend to be. . . And there was a lot of background stuff around the interviewer too. Her office looked fascinating but you were paying attention to that.”

“I would prefer to have it [visits] as a telemedicine and not waste my time, energy and resources.”
### Results - Reliability

Table 2: Inter-site Reliability, Measures of Dementia Status

<table>
<thead>
<tr>
<th>Scale</th>
<th>In-Clinic Score</th>
<th>Telemedicine Score</th>
<th>ICC/Kappa</th>
</tr>
</thead>
<tbody>
<tr>
<td>MoCA (mean, range)</td>
<td>12.2, 0-23</td>
<td>13.1 0-24</td>
<td>0.93</td>
</tr>
<tr>
<td>Visuospatial/Exe</td>
<td>2.1 (0-5)</td>
<td>1.9 (0-5)</td>
<td>0.86</td>
</tr>
<tr>
<td>Letter clapping Categorical</td>
<td></td>
<td></td>
<td>0.69</td>
</tr>
<tr>
<td>CDR (Caregiver component, range)</td>
<td>0.5-3</td>
<td>0.5-3</td>
<td>0.75</td>
</tr>
<tr>
<td>RMBPC (mean, range) (frequency of behaviors)</td>
<td>9.5, 2-18</td>
<td>9.7 (2-18)</td>
<td>0.77</td>
</tr>
<tr>
<td>GDS (mean, range) a</td>
<td>2.3, 0-9</td>
<td>2.0, 0-9</td>
<td>0.61</td>
</tr>
</tbody>
</table>

a Not administered to first seven participants (n=21)
### Results - Reliability

#### Table 3: Inter-site Reliability, Caregiver Measures

<table>
<thead>
<tr>
<th>Scale</th>
<th>In-Clinic Score</th>
<th>Telemedicine Score</th>
<th>ICC/Kappa</th>
</tr>
</thead>
<tbody>
<tr>
<td>MMCGI (mean, range)</td>
<td>47.3, 22-66</td>
<td>46, (23-61)</td>
<td>0.87</td>
</tr>
<tr>
<td>ZBI (mean, range)</td>
<td>6.4, 3-11</td>
<td>6.7, (2-15)</td>
<td>0.79</td>
</tr>
<tr>
<td>RMBPC (mean, range) (reaction to of behaviors)&lt;sup&gt;a&lt;/sup&gt;</td>
<td>11.1, 1-36</td>
<td>11.1, (1-43)</td>
<td>0.80</td>
</tr>
</tbody>
</table>

<sup>a</sup>Not administered to first seven participants (n=21)
Results - Reliability

**Figure 1.1** MOCA Score: Clinic vs. Telemedicine

**Figure 1.2** ZBI Score: Clinic vs. Telemedicine
Future Work
Clinical Practice

• ACT-ON Phase II: Direct-to-home telemedicine clinic follow up visits

• ACT-ON will provide a template for providing telemedicine dementia care across the US, for anyone with a computer and internet access

• Care option fee-for-service visits
Caregiver Research

• Foundation for researchers to use measures of caregiver burden via telemedicine

• STAR-C-TM
  
  o STAR-C is used in assisted living facilities, VA facilities and in communities to train caregivers how to cope with bothersome dementia behaviors
  
  o Currently testing protocol using telemedicine (STAR-C-TM)
Considerations and Conclusions

• Scores on these measures are similar in both the in-clinic and telemedicine direct-to-home environments, suggesting that they can be used via telemedicine with confidence.
• 40% increase in the numbers of persons with ADRD in the US is expected in the next 10 years
• 58% of adults over 65 use the Internet
• Caregivers foundational to care, but many feel unsupported
• Telemedicine assessments can increase care and research options for older adults living with AD and their caregivers.
Thank you!
Acknowledgments:

Study participants

Oregon Office of Rural Health

Layton Aging & Alzheimer’s Disease Center

NIA P30 -AG008017a