

1-1-2015

Translational Study: Telehealth Smartphone App  
Providing Caregiver Support Related to  
Alzheimer's Disease and Related Dementias  
(ADRD)

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# Translational Study: Telehealth Smartphone App Providing Caregiver Support Related to Alzheimer's Disease and Related Dementias (ADRD)

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## Background

Alzheimer's disease is the sixth leading cause of death in the United States and the prevalence of the disease is on the rise (Hebert, 2013). It is estimated that by 2025, the prevalence among Idaho residents will be 33,000 which is a 50% increase over the next 11 years (Hebert, 2013). A diagnosis of Alzheimer's disease is a lifelong diagnosis, and has tremendous costs, both economically and socially. As the ability to carry on the activities of daily living (ADLs) decline, further intervention and caregiving are required. Although there is no cure for ADRD, there are some treatments available to slow the disease progression. The efficacy of these treatments relies on early implementation which is only possible if diagnosis occurs during the earlier stages of the disease.

## Objective

The objective of this study was to evaluate the translational applicability of an existing telehealth application. The technology has been previously evaluated for ease of use with caregivers of patients with autism spectrum disorder. In this translational study, individuals caring for patients with Alzheimer's disease and related dementias provided feedback on ease of use. All research procedures were approved by the Boise State University Social & Behavioral Institutional Review Board, IRB #193-SB14-116.

## Methods and Procedures

- Two week evaluation conducted involving a clinician and two caregivers of patients with cognitive impairment.
- Informed consent obtained from caregiver and individual being videotaped.
  - Caregivers trained on use of the smartphone application with instructions on when to capture video data and what to capture
  - One scenario was the administration of a Mini-Cog assessment. A part of this assessment includes drawing a clock according to specific instructions. The paper copy of the drawing was provided to the clinician for review
  - A second scenario was to record targeted behaviors that the caregiver felt would be clinically significant to diagnosis, or that the caregiver would use to seek assistance in intervention.
  - Video recordings uploaded via a HIPAA compliant server to the clinician.
  - Exit survey completed with the caregivers.
  - Clinician then reviewed the video data for quality and diagnostic applicability.
  - Survey then completed by the clinician.

## Results

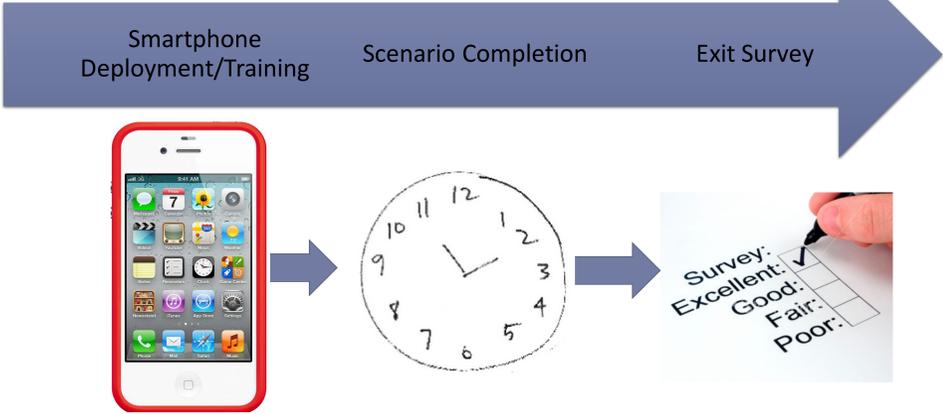
Case #1: Female caregiver of a male patient with mild cognitive impairment

- Does not own a smartphone, had difficulty operating touchscreen
- Completed MiniCog and targeted behavior scenarios completing script exactly as provided
- Caregiver felt anxious to get scenarios right, but did not feel that recording was stressful; also felt that the process of recording behaviors made her feel more aware of patient's behavior and would help evaluate improvements or decline
- Clinician spent 5-10 minutes reviewing videos
- Clinician reported that the telehealth platform was easy to use for accessing and viewing the videos

Case 2: Male caregiver of a female patient with moderate dementia

- Does not own a smartphone, inadvertently deleted application from the device
- Completed MiniCog scenario completing script exactly as provided; videos from targeted behaviors scenario were lost when the application was deleted
- Caregiver was apprehensive to continue working with device after the application was deleted; felt that the recording process was stressful for self, but not the patient
- Clinician spent 5-10 minutes reviewing videos, video data provided was mostly sufficient for determining probable presence or absence of ADRD

## Workflow



## Conclusion

**Ease of use**  
It was difficult to separate the results of ease of use of the application versus the smartphone device, however in general, the caregivers had difficulties in the use of the smartphone telehealth application. Of the two case studies, one caregiver felt apprehensive about using the unfamiliar technology but was able to complete the scenarios as instructed. The second caregiver did not indicate apprehension about using the unfamiliar technology, but was unable to operate the smartphone application to complete the scenarios. Although this study was conducted with a small sample size (n=2), these results may indicate a challenge in a larger population of caregivers of patients with ADRD. About 34% of American adults between the ages of 50-65, and 11% of American adults over the age of 65 currently own a smartphone (Fox, 2012). Both caregivers in the study fell in to the age range with only 11% smartphone ownership, and had difficulties in operating the device. This result is consistent with studies previously conducted which indicated barriers to the use in telehealth technology in elderly population include unfamiliarity with smartphone devices, inappropriate size of the smartphone, and difficult to read font size (Foster, 2014). As our population ages, and older age groups become more familiar with smartphone devices, this application may have improved acceptance and ease of use.

**Scenario Feedback**  
During the course of the study, both caregiver participants indicated hesitation regarding the recording of targeted behaviors. They were unsure of what particular behaviors would be of clinical significance. After the research assistant discussed problem behaviors from the past, and suggested targeting similar situations, the caregivers appeared more at ease with the scenario. Both caregivers were very comfortable with administration of the Mini-Cog assessment, indicating that they had watched the administration of this assessment previously during visits with the patient's physician. The video data supported this comfort level, as the clinician indicated both caregivers were able to follow the provided script and administer the assessment effectively. Future studies using this type of telehealth system may benefit from more structured scenarios for obtaining targeted behavior data of clinical significance. This may ease the pressure from the caregiver attempting to decide on their own what to record.

Overall, the technology has shown promising results with caregivers of patients with autism spectrum disorder, however caregivers of patients with Alzheimer's disease and related dementia do not share the same reported ease of use.

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Fox, S., & Duggan, M. (2012). Mobile health 2012. Pew Research Center's Internet x0026 American Life Project [Internet]; Hebert LE, Weuve J, Scherr PA, Evans DL. Alzheimer disease in the United States (2010–2050) estimated using the 2010 census. *Neurology*. 2013;80:1778-83

