"Can you see it now? Good": Usability Testing of a Mobile Health Application

Sarah Cook, Rita Sembajwe, Emily Geisen, Barbara Massoudi

RTI International

Introduction

- As of the 2010 3rd quarter, 28% of cell phone owners had smartphones (Nielsen 2010)
  - Trend on the rise
- Benefits of smartphone applications
  - Daily diary-type methods of data collection
  - Designed for mobile screens, as opposed to web surveys on mobile browsers
  - More convenient
- Benefits of usability testing
  - Reduce measurement error
  - Reduce respondent burden
    - Faster completion times

Usability Findings for Mobile surveys

- Peytchev and Hill (2010) found that many questionnaire design strategies used on other survey modes can be applied to mobile applications as well with considerations to the small screen size and keyboard functionality.

  - They found that while some features were not difficult (such as scrolling) that participants find it frustrating or annoying.
  - Other participants had difficulty with the precision required of a touch-screen device and using the miniature keyboard for open-ended responses.
Study Background

- **Project HealthDesign** - national program of the Robert Wood Johnson Foundation’s Pioneer Portfolio
  - Support innovation in personal health information technology

- **BreathEasy** - RTI and Virginia Commonwealth University (VCU) Department of Family Medicine
  - Patients with asthma who are at risk for depression or anxiety
  - Entering Observations of Daily Living (ODLs) on smartphones using Android platform
  - Appear in a dashboard for doctors and nurses

After usability testing
- 3-6 month evaluation period
- Follow-up interviews
  - Use of application
  - Usability of application

Smartphone Application Example

- Questions such as: Did you take your oral medications today?
- Options: Yes, No

- Why did you take your oral medications today?
- Answers: Breath, Cough, Other

Clinician Dashboard

- Display shows observations of daily living:
  - Asthma, Sleep, Mood
  - Graphs show trends and alerts for healthcare providers.
**Focus Groups**

- Focus groups conducted with patients, pre-development
- Excited about the idea
- Wanted to complete it every day, multiple times a day
- Wanted to report more information rather than less

---

**Usability Testing**

- Application created utilizing smartphone capabilities
- AT&T Samsung Captivate (Galaxy S)
  - Procedure
    - Entered data themselves
    - Interviewer reviewed data with participant
    - Follow-up questions

---

**Usability Testing Findings: Methods**

- Difficult to watch some participants
  - Hold phone facing themselves
  - Large fingers

- Reviewing data with participants
  - Interviewer holding phone so both can see
  - Best means of both viewing screens
  - However, does not imitate real-life situation
Usability Testing Findings: Front Buttons

- Application used front face buttons
  - Save and Exit

- All participants used the same phone
  - Given brief tutorial of buttons before testing

- Participants still not familiar with uses

Usability Testing Findings: Slide to Navigate

- Slide to navigate date entry pages
  - Introduction explains "like turning pages in a book"

- Participants really liked sliding

- Problems
  - Sliding location
  - Checkboxes selected

Usability Testing Findings: Scrolling Down

- Some pages required scrolling down
  - 2 "mood" screens with emoticons

- Expected participants to scroll down

- Problems
  - Did not know they needed to scroll down
  - Only 2 of 4 answer options were visible
    - These were the most positive responses of "Happy" and "Okay"
Recommendations

- Usability testing methods
  - Use a video camera when possible
  - Have interviewer hold phone

- Smartphone application development
  - If using a swipe feature, provide a line for users to trace
  - When possible, follow the same conventions as web
    - Scroll bar
    - Next and back buttons
    - Save and exit buttons

Future Research

- Improving methods of Smartphone usability testing
  - Better way to view simultaneously
  - Ways to assess Smartphone experience during screening

- Research questions regarding Smartphone applications for data collection
  - Do web-like features help navigation?
  - How long can a Smartphone data collection tool be before respondent fatigue sets in?
    - More or less than web? Phone?
  - How do response rates of Smartphone applications compare to web response rates?

References


