Mental Health Smart Technology

Supporting Mentally Ill Patients in the Community by Using Handheld Devices

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Project Team

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Research Objectives

• Exploratory pilot study to explore and evaluate the effects of community-based treatment supported by mobile (handheld) smart technology

• Focus on rehabilitation: supporting independent living and community integration

• Focus on enhancing cognitive skills: using prompts and reminders from the handheld technologies
Background Literature

- Cognitive impairments are prevalent in schizophrenia & are associated with unemployment, poor social skills, difficulties in independent living, and more (Green et al., 2000)

- Technology has been used to assist with daily living in other populations, such as elderly persons with cognitive impairments (Haigh et al., 2002)

- Stip et al (2005), after reviewing the literature on cognition, remediation, smart homes and related technologies, concluded that rehabilitation of persons with schizophrenia and related cognitive deficits could be enhanced using smart home technology.

- Published research on the use of SMART technology for patients with schizophrenia is limited
Research Site and Sample

Steele Street Residential Treatment and Rehabilitation Program

- Located in St. Thomas; affiliated with St. Joseph’s Health Care London
- Offers integrated treatment, rehabilitation and support for individuals with serious and persistent mental illnesses and accompanying cognitive and other skills deficits
- Step down from hospital stay serving clients who have previously been institutionalized
- Full multidisciplinary team; staffed 24/7

Project Sample: 10 Steele Street residents
Research Design

Mixed methodology longitudinal design

Quantitative Component

• Baseline and endpoint interviews

Interviews included six evaluations:

• Demographics Form
• Montreal Cognitive Assessment (MOCA)
• Clinical Global Impressions – Severity of Illness Scale (CGI-S)
• Global Assessment of Functioning Scale (GAF)
• Social and Occupational Functioning Assessment Scale (SOFAS)
• Community Integration Questionnaire (CIQ)
Research Design

Qualitative Component

• Focus group at endpoint with clients and care providers to discuss experiences with the smart technology

• Purposive sampling of clients: care providers selected a few clients who found working with the technology easy, difficult or neither
Software, Hardware and Services

- Project utilized Lawson Integrated Database (LIDB) developed in Microsoft.net, SQL Database, hosted on hospital standard infrastructure and security standards

- Care providers set up personalized prompts/reminders for each client in the software tool

- Used inexpensive Samsung Galaxy 551 mobile phones

- Standard Basic Service Plans:
  - Unlimited text messages
  - 150 minutes Free Talk ($0.35 additional minutes)
  - Free Local Talk Time for Nights and Weekends (between 6:00pm and 7:00am)
  - 100MB of Data & Free Wifi within Steele Street
Conceptual Overview

[Diagram showing the flow of communication between Health Care Provider – Web-based Application, Web-based Decision Engine, and Clients Handheld Application with Hospital Firewall in the middle.]

1 Way Communication

2 Way Communication

1 Way Communication

2 Way Communication
Example of Care Activities to Help Structure Day

- **Client**
- **Hospital**
- **Integrated Database**
- **Steele Street**

**09:00 p.m.**
- Take Morning Medications with Food and/or Test Blood Sugars

**09:30 p.m.**
- Have lunch and prepare for 1:00 Appointment

**12:00 p.m.**
- Blood Sugar Reading....etc

**05:00 p.m.**
- Have a Shower and Go to Yoga

**06:00 p.m.**
- Dinner Time
- Take Evening Medications

**Discharged to**
- Care Prompts Reminders
Research Findings

Demographic Breakdown of Sample \( (n=10) \)

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Number</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Marital Status: Single/Never Married</td>
<td>10</td>
<td>100.0%</td>
</tr>
<tr>
<td>Has Child(ren)</td>
<td>5</td>
<td>50.0%</td>
</tr>
<tr>
<td>Highest Level of Education: Grade School</td>
<td>6</td>
<td>60.0%</td>
</tr>
<tr>
<td>Currently on Mental Health Medication</td>
<td>10</td>
<td>100.0%</td>
</tr>
<tr>
<td>Has Had a Previous Psychiatric Hospitalization</td>
<td>10</td>
<td>100.0%</td>
</tr>
<tr>
<td>Has a Chronic Physical Illness</td>
<td>5</td>
<td>50.0%</td>
</tr>
</tbody>
</table>

Average Age: 34.6 (SD = 9.40)
# Research Findings

<table>
<thead>
<tr>
<th>Score</th>
<th>Baseline Mean (SD)</th>
<th>Endpoint Mean (SD)</th>
<th>Mean Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td>Community Integration (CIQ Total Score)</td>
<td>13.47 (2.53)</td>
<td>17.81 (3.87)</td>
<td>4.34*</td>
</tr>
<tr>
<td>Cognitive Assessment (MOCA Total Score)</td>
<td>22.67 (4.06)</td>
<td>24.00 (4.47)</td>
<td>1.33</td>
</tr>
<tr>
<td>Severity of Illness (CGI-S Score)</td>
<td>3.78 (1.20)</td>
<td>4.25 (1.03)</td>
<td>0.47</td>
</tr>
<tr>
<td>Social and Occupational Functioning (SOFAS Score)</td>
<td>60.89 (13.69)</td>
<td>57.13 (17.52)</td>
<td>-3.76</td>
</tr>
</tbody>
</table>
Research Findings

Focus Group Themes

Positive Aspects of the Smart Technology

1. Staying Connected to Others

- “I use the phone pretty much everyday when I call my parents, or my cousins, and my aunt and uncle … so I use it to contact my support people, and that does include calling [Steele Street] when I’m out” (client)
- “I like the texting because … it’s good for building relationships” (client)
- “In the past … we’ve had people complaining of anxiety, with paranoid feelings, that sort of thing, that are afraid to go out in the community, its been a real comfort for people that they can basically call someone when they run into trouble” (care provider)
Research Findings

Focus Group Themes

Positive Aspects of the Smart Technology

2. Prompts/Reminders
   - “Med prompts … we also have groups, daily appointments … time management or doctor’s appointments … blood work, all that sort of thing” (care provider)

3. Useful Functions/Applications
   - “It’s actually my alarm clock” (client)
   - “I do my banking on there” (client)
   - “I see a lot of people using it for diversion … the music, MP3 player … when you’re feeling anxiety or you’re just bored or you have symptoms that helps … it’s used a lot that way” (care provider)
Research Findings

Focus Group Themes

Negative Aspects of Smart Technology

• No negative comments regarding the use of smart technology in general
• All negative comments centered around specific mobile phone/service plan utilized for the study
  • Issues with delayed reminders/prompts
  • Sensitivity of screen led to missed calls
  • Service plans did not allow for long distance
  • Clients unaware that some applications cost money
• Disappointment that service plans were canceled at the end of study
  • “It’s kind of frustrating cause I’ve kind of organized my life around the phone … before I could live without it, now…”
Discussion

• Clients benefitted from having smart phones, particularly in the areas of community integration and connecting with others
• Smart phones provided clients with a sense of security to leave home alone
• Funding for sustainable service plans necessary to increase the benefits experienced by clients long-term
References

