Uses of mobile text messaging to engage homeless persons in healthcare

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A Push to Connect Offline Americans to the Internet

“The Obama administration is concerned that 60 million Americans are shut out of jobs, government services, health care and education…”

(August 18, 2013 – Edward Wyatt)
Poll #1

The VA devotes financial and programmatic resources for homeless Veterans. Compared to other Veteran vulnerable groups, do you think the VA efforts for homeless are:

(select one)

a) too little?
b) about the right amount?
c) too much?
Poll #2

Please estimate the percent of homeless Veterans who own a cell phone:
(select one)

a) <20%
b) 21%-50%
c) 51%-70%
d) 71% -100%
Collaborators

Study 1 - Survey
• Henry Anaya
• Karin Eyrich-Garg
• Gemmae Fix
• Allen Gifford
• Thomas Houston
• Thomas O'Toole
• Beth Ann Petrakis
• Sowmya Rao
• Leon Sawh
• David Smelson
• Jeffrey Solomon

Study 2 – Pilot Text Messaging
• Steven Asch
• Erin Johnson
• Allen Gifford
• Thomas O’Toole
• Beth Ann Petrakis
• Sowmya Rao
Session Overview:

• Study 1: Survey of Homeless Veterans Living in Massachusetts
  • 5 minutes for questions

• Study 2: Pilot Test of Appointment Reminders via Text Messaging
  • 10 minutes for questions
Background

- Health of homeless persons is poor
  - Mortality rates 5-9 times higher
  - Emergency Room (ER) use 3 times more often
  - Hospitalized 4 times more often
  - High prevalence of mental illness
  - High prevalence of substance use disorders
Veterans and homelessness

- 62,000 homeless veterans
- 200,000 homeless/unstably housed/at risk

(AJPH supplement 2013 covers homelessness)
Study 1:
Survey of Homeless Veterans Living in Massachusetts
What we found....

• 89% had a mobile phone
  (71% of these used texting)
  (35% of phones were smart phones)

• 79% used the Internet
Methods

- Survey (2012-2013)
  - 5 sites in Massachusetts, recruited total of 106
  - Convenience sample
  - Paper and pencil interviewer administered survey
Recruitment numbers by organization type

<table>
<thead>
<tr>
<th>Type of Organization (all had homelessness focus)</th>
<th>n</th>
</tr>
</thead>
<tbody>
<tr>
<td>Multi-service organization</td>
<td>55</td>
</tr>
<tr>
<td>Domiciliary</td>
<td>22</td>
</tr>
<tr>
<td>Emergency shelters</td>
<td>14</td>
</tr>
<tr>
<td>Transitional housing</td>
<td>9</td>
</tr>
<tr>
<td>Grant per diem</td>
<td>6</td>
</tr>
</tbody>
</table>
Methods: questions

Survey Topics:

• Demographics
• Housing prior to current location
• Technology use
  • Access: mobile phone, Internet, etc.
  • Purposes for using technology
  • Willingness to use technology for communication with health system
  • Barriers to use

Sources: Pew, NCI’s HINTS, Eyrich-Garg 2010 & 2011
Methods: qualitative

With subset of 30 of the 106 participants.
- 30 minute semi-structured interview
- Audio-recordings, field notes, transcriptions

Topics:
- Participant life experiences
- Health concerns
- Use of IT in general
- Use of IT related to health
- Perceptions of possible health related interventions with mobile phones
Method - Analysis

• Survey data
  • Frequency distributions and Chi-square/Fisher’s exact tests

• Qualitative data – analysis of field notes
  • thematic analysis to identify themes and subthemes
  • Creation of codes, inter-rater reliability
  • Coding of 30 field notes
# Results – Survey (n=106)

<table>
<thead>
<tr>
<th>DEMOGRAPHICS &amp; HOUSING</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>96%</td>
</tr>
<tr>
<td>Ages 50-69</td>
<td>72%</td>
</tr>
<tr>
<td>African American</td>
<td>22%</td>
</tr>
<tr>
<td><strong>Current Housing</strong></td>
<td></td>
</tr>
<tr>
<td>Multi-service organization</td>
<td>52%</td>
</tr>
<tr>
<td>Domiciliary (VA)</td>
<td>23%</td>
</tr>
<tr>
<td>Emergency shelter</td>
<td>13%</td>
</tr>
<tr>
<td>Transitional housing (VA)</td>
<td>8%</td>
</tr>
<tr>
<td>Grant per diem</td>
<td>6%</td>
</tr>
</tbody>
</table>
Access to Technologies

Findings:
• 89% have mobile phone
  • 70% use texting
  • 35% are smartphones
• 79% use the Internet
  • Half use the Internet daily
• 86% have an email address
Use, Mobile Calls vs. Internet

Among those with mobile phone, and who use Internet, respectively.
Uses: Email vs. Texting

Among those with email address, and who use texting, respectively
Association of Past Housing & Use of Texting
(among those with a mobile phone)

<table>
<thead>
<tr>
<th>Where lived prior to current location</th>
<th>Use Texting</th>
</tr>
</thead>
<tbody>
<tr>
<td>With relative/friend</td>
<td>92%</td>
</tr>
<tr>
<td>Own house or apartment</td>
<td>86%</td>
</tr>
<tr>
<td>Jail</td>
<td>67%</td>
</tr>
<tr>
<td>Hospital/Dom/Drug Tx/ Transitional</td>
<td>65%</td>
</tr>
<tr>
<td>Emergency Shelter</td>
<td>55%</td>
</tr>
</tbody>
</table>

P=0.07
Association of Current Housing & Use of Technologies (Internet & email)

<table>
<thead>
<tr>
<th></th>
<th>Use Internet</th>
<th>Have email</th>
</tr>
</thead>
<tbody>
<tr>
<td>Multi-type organization</td>
<td>87%</td>
<td>89%</td>
</tr>
<tr>
<td>Domiciliary</td>
<td>86%</td>
<td>82%</td>
</tr>
<tr>
<td>Grant-per-diem</td>
<td>83%</td>
<td>100%</td>
</tr>
<tr>
<td>Transitional housing</td>
<td>56%</td>
<td>67%</td>
</tr>
<tr>
<td>Emergency shelter</td>
<td>50%</td>
<td>50%</td>
</tr>
</tbody>
</table>

P=0.01  P=0.01
## Barriers to IT Use, Past 12 months

<table>
<thead>
<tr>
<th>Barrier</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Phone number change</td>
<td>45%</td>
</tr>
<tr>
<td>Phone broke</td>
<td>28%</td>
</tr>
<tr>
<td>Phone lost</td>
<td>20%</td>
</tr>
<tr>
<td>Phone stolen</td>
<td>17%</td>
</tr>
</tbody>
</table>

Multiple responses permitted,
Among n=101 with mobile phone in past 12 months
### Barriers to IT Use, Past 30 Days

<table>
<thead>
<tr>
<th>Barrier</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Phone out of power when wanted to use</td>
<td>35%</td>
</tr>
<tr>
<td>Ran out of minutes</td>
<td>16%</td>
</tr>
<tr>
<td>Reached limit of texts</td>
<td>6%</td>
</tr>
<tr>
<td>Forgot how to text</td>
<td>6%</td>
</tr>
<tr>
<td>Forgot how to call</td>
<td>4%</td>
</tr>
</tbody>
</table>

Multiple responses permitted
Among 94 with mobile phone; and for texting among 67 who used texting.
Qualitative findings

• Mobile phone already used by some for health related
  • Reminder calls for appointments
  • Already connect with social worker, doctor,
    • “They always check on me”

• Some dislike automatic appointment reminder calls in VA
  • “When you answer it you can’t shut it off and your stuck with it and it eats up all your time and you don’t know who it is”

• Text message: “Well you have something solid in front of you. You don’t have to write it down. You can save it and it’s there. I mean you have all the information right there.”

• Like asynchronous nature of texting
Qualitative findings (cont.)

• Openness to text messaging health:
  • Appointment reminders
  • Reminders to get lab work done
  • Medication refill reminders
  • Outreach “How are you doing? We haven’t seen you lately”
  • Notification that lab results ready (not so sure)

• Downsides of mobile phone and text messages:
  • Too many texts
  • Cost of text and calls
  • Don’t check inbox often enough
  • Lack text messaging skills
Discussion

- Access to mobile phones and Internet.
- Barriers to continuous contact.
  - Change phone #
  - Lost, broken, stolen phone
- Give out phones for interventions?
- What other interventions to consider?

(additional study details in: McInnes et al. 2014 *Telemedicine and e-Health*)
Poll #3

What areas of health should encourage more use of cell phone for the homeless:
(select 2)

a) Text message medication taking reminders
b) Text message appointment reminders (e.g. for clinic visits)
c) Mental health therapy sessions conducted via smartphone
d) For alcohol abusers, GPS triggered support text messages when he/she nears a liquor store.
e) Patients using a text message system to regularly report blood pressure or blood glucose levels to VHA.
Study 2: Pilot Test of Appointment Reminders via Text Messaging
Problems of Continuity of Care for Homeless Veterans

• Relatively high amount of missed visits
  • As high as 44% in some VA settings

• Reasons:
  • Forgetting, unaware of visit, transportation, competing needs (e.g. shelter, food, job)
Technology to Assist with Continuity

• Systematic review shows 40% - 60% of homeless have mobile phones.
• Our survey of homeless and recently homeless veterans found 89% with mobile phone
Pilot Study of Text Messaging: Objectives

• Can text messaging improve appointment attendance?
• Pilot study to assess
  • Feasibility
  • Acceptability
  • Usability
  • Usefulness
  • Measures
Intervention

• Send text messages 5 days and 2 days prior to scheduled appointments
• “Remember: Thurs, October 25th, at 9 AM you have an appointment at Providence VA. If you have questions or need to cancel call xxx xxx-xxxx. Thanks”
• One-way messaging only
• Via Message-Media web-based messaging software
Intervention Delivery

• 8 week period for each patient
• Any scheduled outpatient visit at the VA medical center
  • Primary care
  • Specialty care (cardiology, endocrinology, etc.)
  • Social work
  • Mental health, etc.
• Excluded: daily recurring visits, home care visits, etc.
Site & Participants

- Providence Rhode Island VA Medical Center
  - Homeless Primary Care Clinic

- Participants:
  - Users of the homeless clinic
  - Owned mobile phone
  - Used text messaging
  - Received $15 for baseline survey; $25 for follow-up
Results

Participants
• 21 veterans enrolled
• 20 received text messages
• 16 completed follow-up interview
## Demographics & Housing, N=21

<table>
<thead>
<tr>
<th>Category</th>
<th>Percentage</th>
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</thead>
<tbody>
<tr>
<td>Male</td>
<td>81%</td>
</tr>
<tr>
<td>Ages 50-69</td>
<td>76%</td>
</tr>
<tr>
<td>White</td>
<td>62%</td>
</tr>
<tr>
<td>Income &lt; $12,000</td>
<td>62%</td>
</tr>
<tr>
<td>Health Fair/Poor</td>
<td>62%</td>
</tr>
<tr>
<td>Current Housing</td>
<td></td>
</tr>
<tr>
<td>- Own house/appt.</td>
<td>33%</td>
</tr>
<tr>
<td>- Friend/relative</td>
<td>43%</td>
</tr>
<tr>
<td>- Transitional Housing</td>
<td>10%</td>
</tr>
<tr>
<td>- Motel/Shelter</td>
<td>10%</td>
</tr>
<tr>
<td>- Car or street</td>
<td>5%</td>
</tr>
</tbody>
</table>
Usability & Usefulness

• Usability
  • good for most;
  • one had some difficulty finding messages in inbox

• Usefulness –
  • most found it useful
  • “If I didn’t have this I’d be walking around with a lot of papers in my pocket”
  • All but one indicated they would continue if it were offered.
“Every time I received a text message it was a blessing. I'd get voicemails from the automated system and a lot of times my voicemail wouldn’t go through or it would, [but] it would be all scrambled and I couldn’t understand it. The great thing about the texts is it's all laid out in text form that I can save.”
Feasibility

- Found participants with cell phone who knew how to text
- Most participants seemed to have continuous service
- One veteran lost service for 3 weeks
Utilization Changes Pre- vs. Post-Intervention (n=20)

<table>
<thead>
<tr>
<th>Category</th>
<th>Pre</th>
<th>Post</th>
</tr>
</thead>
<tbody>
<tr>
<td>Patient Cancellations</td>
<td>53</td>
<td>37</td>
</tr>
<tr>
<td>No-Shows</td>
<td>31</td>
<td>25</td>
</tr>
<tr>
<td>ER visits</td>
<td>15</td>
<td>5</td>
</tr>
<tr>
<td>Hospitalization</td>
<td>3</td>
<td>0</td>
</tr>
</tbody>
</table>
Challenges

• Patients enrolled, but couldn’t continue (jail, hospitalization, etc.)
• Some never completed follow-up interview
• Time consuming manual examination of schedules
• Manual editing of text messages
• Not known if message opened and read
Conclusion

• Texting is feasible, usable, and useful with this population

• Larger, controlled study needed to:
  • Confirm there are changes in behavior/utilization
  • Determine how large the changes are
  • Evaluate whether effects diminish over time

• Consider other areas of engagement and behavior change

(additional study details in: McInnes et al. 2014 AJPH)
Acknowledgements

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Questions?
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